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INDEX OF VOLUMES

1. MAIN REPORT
2. WATER SUPPLY
   - Appendix A - Surface Water Resources
   - Appendix B - Ground Water Resources
   - Appendix C - Ground Water Modelling
3. WITHDRAWAL DEMAND AND ASSESSMENT
   - Appendix D - Withdrawal Water Demands
   - Appendix E - Water Balance Model
4. FISHERIES
   - Appendix F - Fisheries Studies; Main Report
   - Appendix G - Fisheries Studies; Detailed Data Report
5. **FISHERIES AND WILDLIFE**
   - **Appendix H - Fish and Fisheries; Status and Utilization**
   - **Appendix I - Water Related Wildlife Resources**
6. RECREATION
   - Appendix J - Water Based Recreation
7. ECOLOGICAL INVENTORY OF LAKE SHORELINES
   - Appendix K - Ecological Inventory of Lake Shorelines; Summary
   - Appendix L - Ecological Inventory of Lake Shorelines; Detailed Report
8. WATER QUALITY
   - Appendix M - Lake Trophic Assessment
   - Appendix N - Impacts of Lake Level Fluctuations on Trophic Status
   - Appendix O - River Water Quality Assessment

COLD LAKE — BEAVER RIVER
WATER MANAGEMENT STUDY

VOLUME 5
FISHERIES AND WILDLIFE

PREPARED BY
PLANNING DIVISION
ALBERTA ENVIRONMENT
December 1983

Submitted to: Hon. F. Bradley
Minister of Environment

APPENDIX H

FISH AND FISHERIES; STATUS AND UTILIZATION

A Report Prepared By
L.A. LONGMORE, AND C.E. STENTON,
ALBERTA ENERGY AND NATURAL RESOURCES,
FISH AND WILDLIFE DIVISION

Alberta
ENERGY AND
NATURAL RESOURCES

FISH AND WILDLIFE DIVISION
8TH FLOOR, 9915 - 108 STREET
SOUTH TOWER, PETROLEUM PLAZA
EDMONTON, ALBERTA T5K 2C9

7th June, 1983

Mr. Ron Hicks
Athabasca River Basin Planner
Planning Division
Alberta Environment
EDMONTON, Alberta

Dear Mr. Hicks:

RE: COLD LAKE - BEAVER RIVER WATER PLANNING STUDY

I am pleased to submit to you a report entitled "The Fish and Fisheries of the Cold Lake - Beaver River Basin - Their Status and Utilization", to be used as an information source in the development of the Cold Lake - Beaver River Water Management Plan.

Yours truly,

C. E. Stenton
Acting Director
of Fisheries

CES/pec

Enclosure

EXECUTIVE SUMMARY

Despite its small size, (only 2.3% of the surface area of Alberta), the Cold Lake - Beaver River watershed is a critically important part of the "Lakeland" tourist area, whose lake fisheries support considerable recreational, commercial and domestic use. The Basin also contains extensive heavy oil deposits, which can only be extracted by steam injection. Water required for industrial use is expected to be abstracted from surface and groundwater sources within the Basin.

To evaluate and coordinate water requirements of all users in the Basin, Alberta Environment initiated the Cold Lake - Beaver River Water Resources study. This summary report of information available concerning the fish and fisheries of the Cold Lake - Beaver River Basin is the Alberta Fish and Wildlife Division, Fisheries Services Branch initial input to the study. The goal of the study is the development of a long-term management plan for the surface and groundwater resources of the Basin. Any water allocation policy or plan must recognize the local, regional and provincial importance of the recreational, commercial and domestic fisheries of the Cold Lake - Beaver River Basin.

The low relief of the Basin results in poor drainage. Consequently, surface water is trapped in muskeg and numerous lakes; there are only a few large rivers. The small, shallow streams are intermittent and contain water only in the spring. Some of these streams provide important migration routes and spawning habitat. The lakes are predominantly shallow and eutrophic, and

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COLD LAKE - BEAVER RIVER WATER MANAGEMENT STUDY

VOLUME 5

FISHERIES AND WILDLIFE

Appendix H . . . Fish and Fisheries: Status and Utilization
Appendix I . . . . Water Related Wildlife Resources

support highly productive fish populations. Sixty-seven lakes are discussed in this report; the combined surface area of 66 of these lakes totals 88,987 ha (219,892 ac). No estimate of surface area is available for Primrose Lake.

Because of the uniformity of the aquatic environment, there is little species diversity in the fish population, which consists of warmwater fish (walleye, perch and pike), coldwater fish (lake whitefish, tullibee, and lake trout in Cold Lake), suckers, and burbot (ling). The productive fish populations of the lakes in the Basin support substantial sport, commercial and domestic use.

Most recreation in the Cold Lake - Beaver River Basin is water-based, and lake sport fishing is the most popular activity. Many anglers travel 161 km (100 mi) or more to fish the lakes in the Basin. Private cottages, campsites, and resorts around the lakes contribute to their heavy recreational use. Two lakes, May and Seibert, are classified as Trophy Lakes, and are managed to maintain populations of large pike for angling under a special licence. Other lakes provide angling opportunities for pike, perch and walleye. In the Energy and Natural Resources Northeast Administrative Region, which includes the Basin, sportfishing exceeded 1,500,000 man-days during 1980, representing 33.7% of all sportfishing activity in the province. Residents of this region accounted for 86% of these man-days of sportfishing.

Commercial fishing provides economic benefits to many residents of the Cold Lake - Beaver River Basin. Between 1970-71 and 1980-81, the mean annual harvest (consisting mainly of tullibee and lake whitefish) from 33 commercially fished lakes in the Basin exceeded 375,000 kg (826,500 lb), representing approximately 16.8% of the mean annual provincial harvest. Since 1975-76, commercial fisheries production in the Basin has constituted 95.4% of the mean annual harvest from Commercial Fishing Zone C, and 20.6% of the mean annual harvest from Zone D.

Although catches are not recorded, licence sales indicate substantial Indian Domestic fishing activity on some lakes in the Basin. Indian Domestic fishing licences sold in the Cold Lake - Beaver River Basin since 1970-71 averaged 44.1% of provincial licence sales. Indian Domestic fishing rights are guaranteed in the Alberta Natural Resources Transfer Act, and although a licence must be obtained and net mesh sizes and possession limits observed, there are no other restrictions on Indian Domestic fishing.

In order to maintain waters capable of producing enough fish to meet recreational, commercial and domestic demands, general fisheries management objectives have been developed by the Alberta Fish and Wildlife Division, Fisheries Services Branch. The right of this agency to manage the fish resource is expressed in the federal Fisheries Act, and its attendant regulations and orders. These general objectives are:

- to maintain existing fish-producing waters
- to improve biological productivity of some waters
- to initiate fish production in some barren waters
- to create new waters capable of fish production
- to enhance some gamefish populations (notably walleye)

Maintenance or enhancement of existing fish populations will necessitate the maintenance of fish species diversity, maintenance of water quality at levels protective of fish and other aquatic life, provision of unobstructed channels for migration, and maintenance of habitat configuration in streams.

The development and implementation of management objectives and strategies is frequently limited by a lack of adequate data and information. Some activities and studies have been recommended for most of the lakes discussed in this report in order to fill the following "data gaps":

- locations of spawning areas, migrations and seasonal movements
- sizes of standing crops of fish
- age structures of fish populations
- levels of fish production
- intensity of sport and domestic fishing, and sizes of catches
- description of existing habitat conditions, and changes in these conditions resulting from recreational, industrial or agricultural activities
- identification of key aquatic habitat, particularly if it is likely to be affected by water abstraction and/or water level fluctuations
- limiting effects of eutrophication on fish production; identification of other limiting factors
- detailed investigation of water chemistry and physical features of some lakes.

With this information, existing fish populations and habitat could be described accurately, and some meaningful estimate could be made as to the type and degree of impact that water manipulation would likely have on the fish and fisheries of individual waters in the Cold Lake - Beaver River Basin.

TABLE OF CONTENTS

Page

EXECUTIVE SUMMARY i

TABLE OF CONTENTS v

LIST OF FIGURES xi

LIST OF TABLES xii

ACKNOWLEDGEMENTS xx

I INTRODUCTION 1

OBJECTIVES OF THIS REPORT 3
METHODOLOGY AND SOURCES OF DATA 4

II OVERVIEW 5

III THE FISHERIES OF THE COLD LAKE - BEAVER RIVER BASIN

THE FISH POPULATION 10

Fish Species of the Cold Lake - Beaver River Basin 11

LEGISLATION RELEVANT TO THE PROTECTION AND MANAGEMENT OF THE FISH RESOURCE 12

DEMAND FOR SPORT FISHING RECREATION 14

COMMERCIAL FISHING 22

Commercially Fished Lakes in the Cold Lake - Beaver River Basin 22

INDIAN DOMESTIC FISHING 30

FISHERIES MANAGEMENT GOALS AND OBJECTIVES 32

IV WATER QUALITY REQUIREMENTS FOR FISH PRODUCTION IN THE COLD LAKE - BEAVER RIVER BASIN 35

V MAJOR FISH-PRODUCING WATERS OF THE COLD LAKE - BEAVER RIVER BASIN 40

Page

AMISK LAKE 44

AMISK RIVER 46

ANGLING LAKE 46

BANGS LAKE 47

BEARTRAP LAKE 49

BEAVER LAKE 50

BEAVER RIVER 52

BOURQUE LAKE 52

BURNT LAKE 53

BURNT LAKE 57

CANOE LAKE 57

CARIBOU LAKE 58

CHATWIN LAKE 59

CHICKENHILL LAKE 59

CHUMP LAKE 60

COLD LAKE 62

COLUMBINE CREEK 63

CORNER LAKE 65

ELINOR LAKE 66

ERNESTINA LAKE 68

ETHEL LAKE 68

FISHER CREEK 69

FLOATINGSTONE CREEK 71

Page

FLOATINGSTONE LAKE 72
FORK CREEK 73
FORK LAKE 73
FRENCHMAN LAKE 74
GARNER LAKE 76
GOODFISH LAKE 78
GREENSTREET LAKE 79
HASSE LAKE 80
HELENA LAKE 81
HILDA LAKE 83
HONEY LAKE 85
IPIATIK LAKE 85
IRONWOOD LAKE 86
JACKFISH CREEK 88
KEHIWIN LAKE 90
KINOSIU LAKE 91
LANE LAKE 93
LEMING LAKE 94
LODGE LAKE 94
LONE PINE LAKE 97
LONG LAKE 97
LOSEMAN LAKE 98
MANATOKAN CREEK 99
MANATOKAN LAKE 100

Page

LOWER MANN LAKE 100

UPPER MANN LAKE 101

MARIE CREEK 102

MARIE LAKE 102

MARTINEAU RIVER 105

MAY LAKE 105

MEDLEY RIVER 106

MINNIE LAKE 107

MISSAWAWI LAKE 107

MOORE LAKE 109

MOOSE LAKE 110

MOOSELAKE RIVER 112

MURIEL CREEK 113

MURIEL LAKE 113

NORTH BUCK LAKE 114

OSBORNE CREEK 118

PINEHURST LAKE 118

PRIMROSE LAKE 119

PUNK CREEK 121

REDSPRING CREEK 123

REITA CREEK 124

REITA LAKE 124

RICH LAKE 126

Page
ST. LINA CREEK 127
SAND RIVER 127
SCHELTENS LAKE 128
SEIBERT LAKE 129
SINCLAIR LAKE 129
SKELETON LAKE 130
SOARS LAKE 132
SPENCER LAKE 133
TAWAKWATO LAKE 135
THINLAKE RIVER 136
THOMPSON LAKE 137
TOMPKINS LAKE 138
TOUCHWOOD LAKE 139
TUCKER LAKE 141
WAYETENAU LAKE 142
WHITEFISH LAKE 144
WOLF LAKE 145
WOLF RIVER 149
VI CONCLUSIONS 150
VII RECOMMENDATIONS 153

APPENDIX

Page

ANNUAL COMMERCIAL FISHERIES SPECIES HARVESTS: TABLES XLVI TO LIV 154

SUMMARY OF SIGNIFICANT FEATURES OF MAJOR FISH-PRODUCING WATERS OF THE COLD LAKE-BEAVER RIVER BASIN, TABLE LV 163

BIBLIOGRAPHY 167

LIST OF FIGURES

Page

1. Provincial Location of Cold Lake - Beaver River Basin 6
2. Cold Lake - Beaver River Basin: Lakes and Streams of Major Importance to Regional Water Resources Study 7
3. Portion of the Cold Lake-Beaver River Basin Covered by Map Sheet 73-L 15
4. Angling Licence Sales and Projected Sales for the Province 17
5. Percent of Man-Days of Angling in the Northeast Region During 1980 by Residents of Each Region 20
6. Commercially Fished Lakes the Cold Lake - Beaver River Basin 23
7. Major Fish-Producing Waterbodies of the Cold Lake-Beaver River Basin 41

LIST OF TABLES

		Page
I	Angling Licence Sales in the Cold Lake-Beaver River Basin	16
II	Trophy Lake Licence Sales in Alberta, 1970-71 to 1979-80	18
III a	Man-Days of Angling by Albertans in the Energy and Natural Resources Administrative Region, and Banff and Jasper National Parks in 1980	19
III b	Man-Days of Angling by Albertans in the Northeast Administrative Region by Residents of Other Administrative Regions	19
IV	Commercially Fished Lakes in Zone C and D, and in the Cold Lake-Beaver River Basin Area of Each Zone, 1970-71 to 1980-81	24
V	Commercial Fishing Licence Sales for Zones C and D, 1970-71 to 1980-81	24
VI	Commercial Fisheries Harvests from the Cold Lake-Beaver River Basin, 1970-71 to 1980-81	26
VII	Market Value of Commercial Fisheries Harvests from the Cold Lake-Beaver River Basin, 1970-71 to 1980-81	27
VIII	Value to Fishermen of Commercial Fisheries Harvests from the Cold Lake-Beaver River Basin, 1970-71 to 1980-81	28
IX	Mean Harvests and Values of Commercially Fished Species in the Cold Lake-Beaver River Basin, 1970-71 to 1980-81	29
X	Indian Domestic Fishing Licence Sales for Lakes in the Cold Lake-Beaver River Basin, 1970-71 to 1980-81	31
XI	Indian Domestic Fishing Licences Sold in the Cold Lake-Beaver River Basin and in the Province, 1970-71 to 1980-81	30

		Page
XII	Alberta Fish and Wildlife Division Water Quality Criteria for the Protection of Fish and the Aquatic Environment	37
XIII a	Commercial Fisheries Harvests from Amisk Lake, 1970-71 to 1980-81	45
XIII b	Dollar Value of Commercial Fisheries Harvests from Amisk Lake, 1970-1971 to 1980-81: Market Value (Value to Fishermen)	45
XIV a	Commercial Fisheries Harvests from Bangs Lake, 1970-71 to 1980-81	48
XIV b	Dollar Value of Commercial Fisheries Harvests from Bangs Lake, 1970-71 to 1980-81: Market Value (Value to Fishermen)	48
XV a	Commercial Fisheries Harvests from Beaver Lake, 1970-71 to 1980-81	51
XV b	Dollar Value of Commercial Fisheries Harvests from Beaver Lake, 1970-71 to 1980-81: Market Value (Value to Fishermen)	51
XVI a	Commercial Fisheries Harvests from Bourque Lake, 1970-71 to 1980-81	54
XVI b	Dollar Value of Commercial Fisheries Harvests from Bourque Lake, 1970-71 to 1980-81	54
XVII a	Commercial Fisheries Harvests from Burnt Lake (67-3-W4), 1970-71 to 1980-81	56
XVII b	Dollar Value of Commercial Fisheries Harvests from Burnt Lake (67-3-W4), 1970-71 to 1980-81: Market Value (Value to Fishermen)	56
XVIII a	Commercial Fisheries Harvests from Chump Lake, 1970-71 to 1980-81	61
XVIII b	Dollar Value of Commercial Fisheries Harvests from Chump Lake, 1970-71 to 1980-81: Market Value (Value to Fishermen)	61

Page

XIX a Commercial Fisheries Harvests from Cold Lake, 1970-71 to 1980-81 64

XIX b Dollar Value of Commercial Fisheries Harvests from Cold Lake, 1970-71 to 1980-81: Market Value (Value to Fishermen) 64

XX a Commercial Fisheries Harvests from Elinor Lake, 1970-71 to 1980-81 67

XX b Dollar Value of Commercial Fisheries Harvests from Elinor Lake, 1970-71 to 1980-81: Market Value (Value to Fishermen) 67

XXI a Commercial Fisheries Harvests from Ethel Lake, 1970-71 to 1980-81 70

XXI b Dollar Value of Commercial Fisheries Harvests from Ethel Lake, 1970-71 to 1980-81: Market Value (Value to Fishermen) 70

XXII a Commercial Fisheries Harvests from Fork Lake, 1970-71 to 1980-81 75

XXII b Dollar Value of Commercial Fisheries Harvests from Fork Lake, 1970-71 to 1980-81: Market Value (Value to Fishermen) 75

XXIII a Commercial Fisheries Harvests from Frenchman Lake, 1970-71 to 1980-81 77

XXIII b Dollar Value of Commercial Fisheries Harvests from Frenchman Lake, 1970-71 to 1980-81: Market Value (Value to Fishermen) 77

XXIV a Commercial Fisheries Harvests from Helena Lake, 1970-71 to 1980-81 82

XXIV b Dollar Value of Commercial Fisheries Harvests from Helena Lake, 1970-71 to 1980-81: Market Value (Value to Fishermen) 82

XXV a Commercial Fisheries Harvests from Hilda Lake, 1970-71 to 1980-81 84

Page

XXV b Dollar Value of Commercial Fisheries Harvests from Hilda Lake, 1970-71 to 1980-81: Market Value (Value to Fishermen) 84

XXVI a Commercial Fisheries Harvests from Ipiatik Lake, 1970-71 to 1980-81 87

XXVI b Dollar Value of Commercial Fisheries Harvests from Ipiatik Lake, 1970-71 to 1980-81: Market Value (Value to Fishermen) 87

XXVII a Commercial Fisheries Harvests from Ironwood Lake, 1970-71 to 1980-81 89

XXVII b Dollar Value of Commercial Fisheries Harvests from Ironwood Lake, 1970-71 to 1980-81: Market Value (Value to Fishermen) 89

XXVIII a Commercial Fisheries Harvests from Kehiwin Lake, 1970-71 to 1980-81 92

XXVIII b Dollar Value of Commercial Fisheries Harvests from Kehiwin Lake, 1970-71 to 1980-81: Market Value (Value to Fishermen) 92

XXIX a Commercial Fisheries Harvests from Lodge Lake, 1970-71 to 1975-75 95

XXIX b Dollar Value of Commercial Fisheries Harvests from Lodge Lake, 1970-71 to 1974-75: Market Value (Value to Fishermen) 96

XXX a Commercial Fisheries Harvests from Marie Lake, 1970-71 to 1980-81 104

XXX b Dollar Value of Commercial Fisheries Harvests from Marie Lake, 1970-71 to 1980-81: Market Value (Value to Fishermen) 104

XXXI a Commercial Fisheries Harvests from Missawawi Lake, 1970-71 and 1974-75 108

XXXI b Dollar Value of Commercial Fisheries Harvests from Missawawi Lake, 1970-71 and 1974-75: Market Value (Value to Fishermen) 108

Page

XXXII a Commercial Fisheries Harvests from Moose Lake, 1970-71 to 1980-81 111

XXXII b Dollar Value of Commercial Fisheries Harvests from Moose Lake, 1970-71 to 1980-81: Market Value (Value to Fishermen) 111

XXXIII a Commercial Fisheries Harvests from Muriel Lake, 1970-71 to 1980-81 115

XXXIII b Dollar Value of Commercial Fisheries Harvests from Muriel Lake, 1970-71 to 1980-81: Market Value (Value to Fishermen) 115

XXXIV a Commercial Fisheries Harvests from North Buck Lake, 1970-71 to 1980-81 117

XXXIV b Dollar Value of Commercial Fisheries Harvests from North Buck Lake, 1970-71 to 1980-81: Market Value (Value to Fishermen) 117

XXXV a Commercial Fisheries Harvests from Pinehurst Lake, 1970-71 to 1980-81 120

XXXV b Dollar Value of Commercial Fisheries Harvests from Pinehurst Lake, 1970-71 to 1980-81: Market Value (Value to Fishermen) 120

XXXVI a Commercial Fisheries Harvests from Primrose Lake, 1970-71 to 1980-81 122

XXXVI b Dollar Value of Commercial Fisheries Harvests from Primrose Lake, 1970-71 to 1980-81: Market Value (Value to Fishermen) 122

XXXVII a Commercial Fisheries Harvests from Reita Lake, 1978-79 to 1980-81 125

XXXVII b Dollar Value of Commercial Fisheries Harvests from Reita Lake, 1978-79 to 1980-81: Market Value (Value to Fishermen) 125

XXXVIIIa Commercial Fisheries Harvests from Skeleton Lake, 1970-71 to 1980-81 131

Page

XXXVIIIb Dollar Value of Commercial Fisheries Harvests from Skeleton Lake, 1970-71 to 1980-81: Market Value (Value to Fishermen) 131

XXXIX a Commercial Fisheries Harvests from Spencer Lake, 1970-71 to 1980-81 134

XXXIX b Dollar Value of Commercial Fisheries Harvests from Spencer Lake, 1970-71 to 1980-81: Market Value (Value to Fishermen) 134

XL a Commercial Fisheries Harvests from Tawakwato Lake, 1970-71 to 1972-73 135

XL b Dollar Value of Commercial Fisheries Harvests from Tawakwato Lake, 1970-71 to 1972-73: Market Value (Value to Fishermen) 136

XLI a Commercial Fisheries Harvests from Thompson Lake, 1978-79 to 1980-81 137

XLI b Dollar Value of Commercial Fisheries Harvests from Thompson Lake, 1978-79 to 1980-81: Market Value (Value to Fishermen) 138

XLII a Commercial Fisheries Harvests from Touchwood Lake, 1970-71 to 1980-81 140

XLII b Dollar Value of Commercial Fisheries Harvests from Touchwood Lake, 1970-71 to 1980-81: Market Value (Value to Fishermen) 140

XLIII a Commercial Fisheries Harvests from Tucker Lake, 1970-71 to 1980-81 143

XLIII b Dollar Value of Commercial Fisheries Harvests from Tucker Lake, 1970-71 to 1980-81: Market Value (Value to Fishermen) 143

XLIV a Commercial Fisheries Harvests from Whitefish Lake, 1970-71 to 1980-81 146

XLIV b Dollar Value of Commercial Fisheries Harvests from Whitefish Lake, 1970-71 to 1980-81: Market Value (Value to Fishermen) 146

Page

XLV a Commercial Fisheries Harvests from Wolf Lake, 1970-71 to 1980-81 148

XLV b Dollar Value of Commercial Fisheries Harvests from Wolf Lake, 1970-71 to 1980-81: Market Value (Value to Fishermen) 148

XLVI Summary of Annual Commercial Whitefish Harvests and Values of Harvests from the Cold Lake - Beaver River Basin, 1970-1971 to 1980-81 154

XLVII Summary of Annual Commercial Walleye Harvests and Values of Harvests from the Cold Lake - Beaver River Basin, 1970-1971 to 1980-1981 155

XLVIII Summary of Annual Commercial Perch Harvests and Values of Harvests from the Cold Lake - Beaver River Basin, 1970-1971 to 1980-81 156

XLIX Summary of Annual Commercial Pike Harvests and Values of Harvests from the Cold Lake - Beaver River Basin, 1970-1971 to 1980-1981 157

L Summary of Annual Commercial Tullibee Harvests and Values of Harvests from the Cold Lake - Beaver River Basin, 1970-1971 to 1980-1981 158

LI Summary of Annual Commercial Ling Harvests and Values of Harvests from the Cold Lake - Beaver River Basin, 1970-1971 to 1980-81 159

LII Summary of Annual Commercial Sucker Harvests and Values of Harvests from the Cold Lake - Beaver River Basin, 1970-1971 to 1980-81 160

LIII Summary of Annual Commercial Trout Harvests and Values of Harvests from the Cold Lake - Beaver River Basin, 1970-1971 to 1980-81 161

LIV Summary of Annual Commercial Roe Harvests and Values of Harvests from the Cold Lake - Beaver River Basin, 1970-1971 to 1980-81 162

Page

LV Summary of Significant Features of Major Fish-Producing Waters of the Cold Lake - Beaver River Basin 163

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I. INTRODUCTION

The Cold Lake-Beaver River Basin is the westernmost portion of the Churchill River system, which extends from Alberta to Hudson's Bay. The Cold Lake-Beaver River Basin consists of muskeg, numerous lakes, and a few major rivers. Many of the smaller rivers and streams are intermittent, but they provide valuable seasonal habitat (eg. during spawning). The lakes in this area are highly productive, and their fish populations support considerable sport, commercial, and domestic use.

Recently, industrial interest has focussed on the heavy oils located deep in the geological formations beneath the Basin. Extraction of this oil will involve pumping steam into the formations to mobilize the heavy crude. Because this procedure will require tremendous volumes of water, it is essential that the ecological effects and potential problems of surface water abstraction for industrial purposes be thoroughly evaluated prior to allocating significant quantities of the water resources of the Basin. To coordinate and evaluate the different impacts of this industrial water use, the Cold Lake-Beaver River Water Resources Study was initiated in 1981 by Alberta Environment. The goal of this study is to develop a plan for the long-term management of the surface and groundwater resources of the area.

This report constitutes the Alberta Fish and Wildlife Division, Fisheries Services Branch initial input into the development of this water resources management plan. It describes the fisheries of the Basin, their levels of production and use, and tentatively recommends, based on existing data, the water quality criteria required to sustain or enhance existing levels of fish production. Fisheries management objectives, and data gaps for the fish and fisheries are identified for each waterbody discussed in the report.

OBJECTIVES OF THIS REPORT

As a statement of existing fisheries production and management in the Cold Lake-Beaver River Basin, this report has six major objectives:

- to identify fish populations, and productivities of the major fish-producing waters of the Basin.
- to describe the recreational, commercial, and Indian Domestic fisheries of the Cold Lake-Beaver River Basin.
- to identify significant gaps in available data and information concerning fish population sizes and distributions, productivity characteristics, habitat requirements, and the level and nature of demand on the fisheries of the Cold Lake-Beaver River Basin.
- to describe some water quality parameters and criteria that are protective of fish and other aquatic life.
- to identify the legislation pertinent to the protection and use of the fish resources.

METHODOLOGY AND SOURCES OF DATA

To fulfill the objectives of this report, the productivity, habitat, and recreational and commercial significance of the major lakes and rivers were reviewed individually.

Commercial fishing statistics were obtained from annual catch records of the Fisheries Services Branch, Alberta Fish and Wildlife Division. Angling statistics were obtained from creel census information (Wolf Lake only), records of angling licence sales in the Basin, and the 1980 Sports Fishing Survey Questionnaire (Manuscript).

Fish habitat and fish population information was obtained from available Fisheries Services Branch and consultants' reports (see Bibliography, Appendix), the Agricultural Rehabilitation and Development Act (ARDA) - Canada Land Inventory Sport Fish Capability Surveys (Rhude, 1976; 1978), and interviews with H. Norris, Regional Fisheries Biologist (St. Paul).

Water quality criteria and parameters were developed from an extensive review of current information. The same criteria were also presented in "The Fish and Fisheries of the South Saskatchewan River Basin" (Longmore and Stenton, 1981).

Mapping and photo-reductions for this report were provided by Cartographic Services, Resource Evaluation and Planning Division, Alberta Energy and Natural Resources.

II. OVERVIEW

The Cold Lake-Beaver River Basin is the westernmost portion of the Churchill River system. The Basin covers 2.3% of the surface area of Alberta (Ramsaroop and Card, 1978), as shown in Figure 1. The larger rivers and lakes in the Basin provide numerous summer and winter sport fishing opportunities, and support substantial Indian Domestic and commercial fisheries.

Thirteen lakes and 7 streams have been identified as having particular significance to industrial water abstraction. They are located in the eastern portion of the Basin (Figure 2). If the present levels of fish production and utilization in these and other Basin waters are to be maintained, it is essential that water quality and quantity be maintained at levels protective of fish. Plans for the allocation of water for industrial or other purposes should recognize the importance of the Basin fisheries to local, regional and provincial residents.

Fish production in the Cold Lake-Beaver River Basin is largely determined by natural factors. The local geography is of low relief with poor drainage. Except for the Beaver River and its major tributaries, the Amisk and Sand Rivers, most smaller streams are shallow and slow-flowing. Most become intermittent or stagnant in the summer, and may suffer from dissolved oxygen depletion. A few serve as spawning sites or migration routes to spawning grounds during peak spring flows (Rhude, 1976).

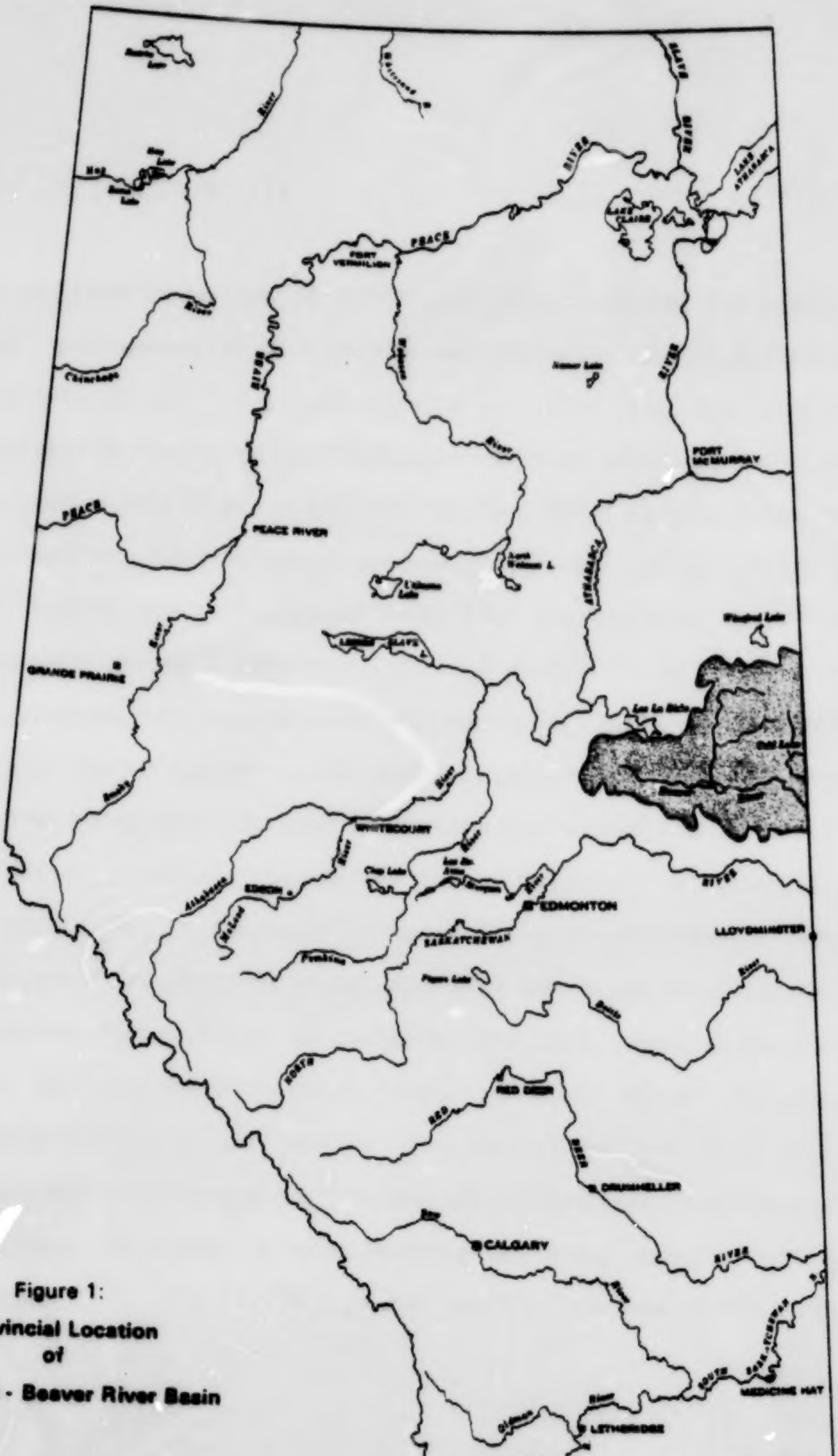

Hay
Hay Lake
River
Chinchaga
River
PEACE
FORT VERMILION
PEACE
RIVER
SLAVE
RIVER
LAKE ATHABASCA
LAKE CLAIRE
Wabasca
River
RIVER
FORT McMURRAY
PEACE
PEACE RIVER
GRANDE PRAIRIE
River
Lesser Slave L.
ATHABASCA
Lac La Biche
Cold Lake
Beaver
River
Smoky
River
WHITECOURT
River
Chip Lake
Lac Ste. Anne
EDSON
Athabasca
McLeod
Pembina
EDMONTON
RIVER
SASKATCHEWAN
LLOYDMINSTER
Pigeon Lake
Battle
River
NORTH
RED DEER
RED
DEER
DRUMHELLER
Bow
CALGARY
RIVER
Bow
SOUTH
SASKATCHEWAN
MEDICINE HAT
River
Oldman
LETHBRIDGE
St. Mary Res.
Milk
Pakowki Lake

Figure 1:
Provincial Location
of
Cold Lake - Beaver River Basin

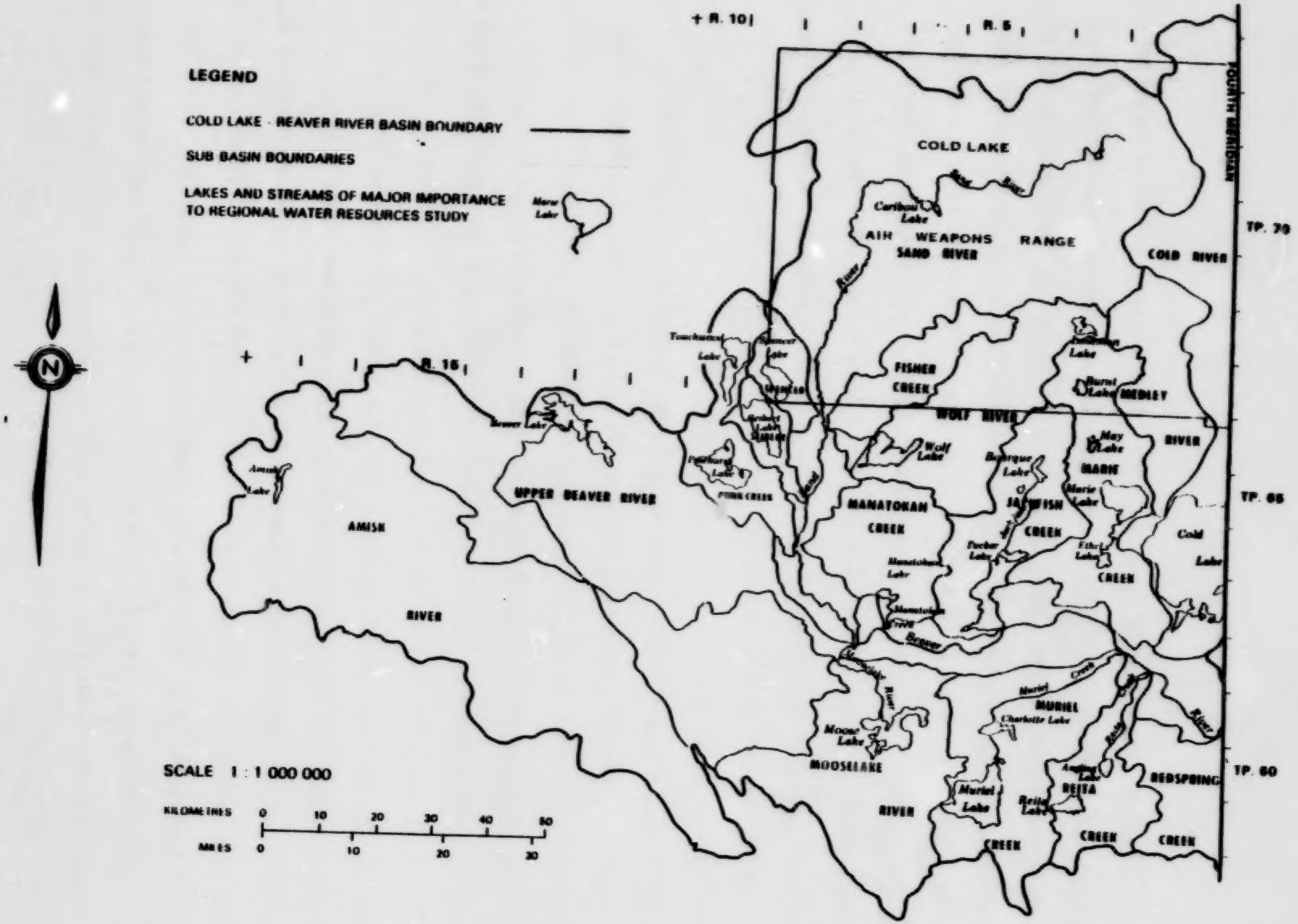

LEGEND
COLD LAKE - BEAVER RIVER BASIN BOUNDARY
SUB BASIN BOUNDARIES
LAKES AND STREAMS OF MAJOR IMPORTANCE TO REGIONAL WATER RESOURCES STUDY
Marie Lake
SCALE 1 : 1 000 000
KILOMETRES 0 10 20 30 40 50
MILES 0 10 20 30
N
R. 10
R. 5
R. 15
FOURTH MERIDIAN
TP. 70
TP. 65
TP. 60
COLD LAKE
AIR WEAPONS RANGE
SAND RIVER
Caribou Lake
Sand River
COLD RIVER
FISHER CREEK
MEDLEY
RIVER
Burnt Lake
WOLF RIVER
Wolf Lake
May Lake
MARIE
Marie Lake
Bourque Lake
JACKFISH CREEK
Tucker Lake
Ethel Lake
CREEK
Cold Lake
MANATOKAN CREEK
Manatokan Lake
Touchwood Lake
Spencer Lake
Pinehurst Lake
PINE CREEK
UPPER BEAVER RIVER
Beaver Lake
Amisk Lake
AMISK
RIVER
Beaver
Sand River
Moose Lake
MOOSELAKE
RIVER
Muriel Creek
MURIEL
Charlotte Lake
Muriel Lake
CREEK
Reita Lake
REITA
CREEK
BEDSPRING
CREEK
River

Figure 2: Cold Lake - Beaver River Basin

Although the larger rivers and streams provide some sportfishing opportunities, most angling activity is concentrated on the lakes, particularly the larger lakes that have cottages or developed recreational facilities along the shoreline. With the exception of Cold Lake and Primrose Lake (Alberta portion), which are very deep and oligotrophic, most of the lakes in the Basin are shallow and eutrophic, and support productive fish populations. Several lakes are noted for very large perch or pike. Two of these lakes (May and Seibert) are designated as Trophy Lakes, and are managed to maintain healthy populations of large pike.

Thirty-three lakes in the Basin support commercial fishing. Harvests from these lakes between 1970-71 and 1980-81 represented an average of 16.8% of the annual provincial commercial fisheries harvest. Although catches are not recorded, licence sales indicate extensive Indian Domestic fishing on many lakes. Between 1970-71 and 1980-81, Indian Domestic fishing licences sold in the Cold Lake-Beaver River Basin represented an annual average of 44.1% of all Indian Domestic fishing licences sold in the province.

Maintenance and enhancement of the fish populations in the Cold Lake-Beaver River Basin is essential to accomodate local and regional angling pressure, and domestic and commercial harvests. Allocation of adequate water for the protection of the fish habitat and populations will be particularly important when heavy oil extraction procedures are initiated.

The following general fisheries management objectives (and specific objectives for major fish-producing waters discussed in this report) have been developed based on existing data and information acquired from Alberta Fish and Wildlife biologists, and numerous reports (see Bibliography, Appendix):

- maintenance or improvement of water quality to standards designated in this report as being protective of the fish populations (see Chapter IV, this report).
- maintenance of habitat configuration in rivers (pools, riffles, refugia, substrate composition, bank stability).
- maintenance or enhancement of species diversity in the fish populations.
- maintenance of unobstructed natural channels to permit continued fish passage through them.

The development of future fisheries management strategies will require additional, and more detailed information on the ecology, habitat, and productivity of the Basin fish populations, particularly:

- descriptions of standing crops of fish; levels of fish production and limiting effects of eutrophication; limiting effects of fluctuations in water discharges and low discharges; identification of other limiting factors.
- description and documentation of suspected fish migrations, critical habitat associated with migrations, and the significance of major tributaries as seasonal habitat for fishes.
- identification of existing habitat conditions and any changes in these conditions resulting from agricultural, industrial, recreational or flow regulation activites.

III. THE FISHERIES OF THE COLD LAKE - BEAVER RIVER BASIN

THE FISH POPULATION

Predominantly warm and eutrophic, the lakes in the Cold Lake - Beaver River Basin are inhabited by warmwater and tolerant coldwater fish species. Resident populations of these fishes are also found in the larger rivers. Because the aquatic environment is fairly homogenous, there is relatively little species diversity in the Basin fish populations.

Of the coldwater fishes, lake trout are the most environmentally sensitive, and are found only in the deep, cold, well-oxygenated waters of Cold Lake. Tullibee and lake whitefish are found in cool, well-oxygenated waters of all larger lakes in the Basin. Rainbow trout, although not native to the Basin, are stocked in Chatwin and Hasse Lakes, and the Medley River. Of the warmwater fishes, pike, walleye, and perch are found throughout most of the lakes in varying abundance. Burbot (ling) are fairly common, and white suckers, which are tolerant of a wide range of environmental conditions, are ubiquitous throughout the Basin waters. Longnose suckers are also present, but are not as numerous or wide-spread as white suckers.

Pike, walleye, and perch are the most popular recreational species. Many lakes in the Cold Lake - Beaver River Basin are noted for large perch and pike. May and Siebert Lakes, which are managed to maintain trophy-sized pike, represent 2 out of a total of 7 provincial Trophy Lakes. Whitefish and tullibee constitute the bulk of the marketable commercial fisheries harvests.

Pike, walleye, perch and whitefish spawn in the shallow, reedy waters around lakeshores. Pike and walleye are also believed to spawn in tributary streams, and in marshes situated along these streams. Although they are dry over much of the year, the spawning habitat these streams provide during the spring is extremely important. Severe water level fluctuations in lakes, or diminished spring flows in streams could cause a loss of spawning habitat great enough to limit reproduction of these important species.

Major Fish Species of the Cold Lake - Beaver River Basin

Coldwater Fishes: Lake Trout (*Salvelinus namaycush*)
Lake Whitefish (*Coregonus clupeaformis*)
Tullibee (*Coregonus artedii*)

Warmwater Fishes: Northern Pike (*Esox lucius*)
Yellow Perch (*Perca flavescens*)
Walleye (*Stizostedion vitreum*)
Longnose Sucker (*Catostomus catostomus*)
White Sucker (*Catostomus commersoni*)
Burbot (Ling) (*Lota lota*)

LEGISLATION RELEVANT TO THE PROTECTION AND MANAGEMENT OF THE FISH RESOURCE

In Canada all matters of protection and management of the fish resource come under the jurisdiction of the Fisheries Act of Canada and its attendant regulations and instruments. For Alberta there are two such instruments: the Alberta Fishery Regulations (pursuant to Section 34 of the Fisheries Act) and the Alberta Fish Propagation Order (pursuant to Section 44 of the Fisheries Act).

This legislation insures the continued presence and production of fish in Alberta, and governs their use for public benefit. Sections of the Fisheries Act provide for the protection of the fish and fish habitat from destruction (by physical damage or by the addition of deleterious materials to the habitat), and the orderly exploitation of the fish resources.

In Alberta, all fisheries, whether recreational, commercial or domestic, must be carried out only under the authority of specific licences issued annually pursuant to the Alberta Fishery Regulations (Section 4, Alberta Fishery Regulations).

The Indian Domestic fishery, although carried out under the authority of a licence, is also guaranteed in a separate piece of legislation: The Alberta Natural Resources Act (1930). Section 12 of that Act states:

> "12. In order to secure to the Indians of the Province the continuance of the supply of game and fish for their support and subsistence, Canada agrees that the laws respecting game in force in the Province from time to

> time shall apply to the Indians within the boundaries thereof, provided, however, that the said Indians shall have the right, which the Province hereby assures to them, of hunting, trapping, and fishing game and fish for food at all seasons of the year on all unoccupied Crown lands and on any other lands to which the said Indians may have a right of access."

The other instrument of the Fisheries Act, the Alberta Fish Propagation Order, provides the Minister (in Alberta, the Associate Minister of Public Lands and Wildlife) with the authority to close any fishing activity on any area for the protection of fish for propagation purposes.

DEMAND FOR SPORTFISHING RECREATION

Interest in sportfishing as a recreational pastime has increased throughout the province in recent years, and has increased noticeably in the Cold Lake - Beaver River Basin, mainly due to high quality sportfishing opportunities afforded by the productive lakes. Rhude (1976) classified almost 76% of all waters in mapsheet 73-L (Figure 3) according to ARDA (Agricultural Rehabilitation and Development Act) Canada Land Inventory standards as Class 1 or 2 (67.3% Class 1; 8.5% Class 2), having few or no limitations to sport fish production. These waters consist mainly of lakes, since most streams are intermittent, and provide only seasonal habitat for fish.

Most (75%) of the streams surveyed by Rhude were Class 3 or 4, having serious limitations on sport fish production. However, some of the larger rivers support resident fish populations, which provide stream angling opportunities. The Beaver River, the mouth of the Thinlake River, the headwaters of the Mooselake River, and the lower Medley River (which is stocked with trout) are all utilized by anglers. The upper Sand River and its tributaries may have sportfishing potential, but they lie within the Department of National Defence Primrose Lake Air Weapons Range, and access is strictly controlled.

The abundant and highly productive lakes in the Basin provide most of the sportfishing opportunities. Those that are easily accessible, those with

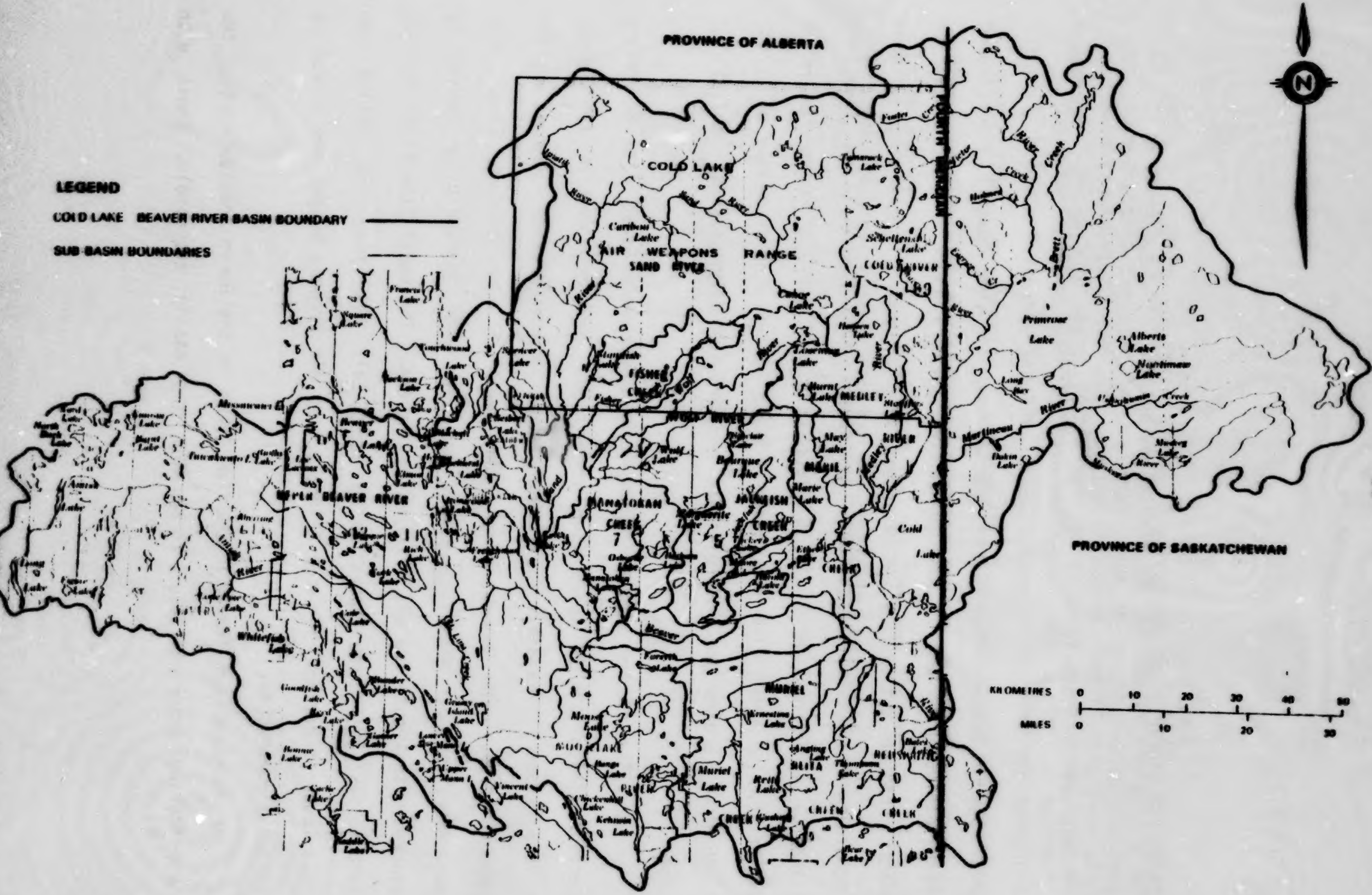

PROVINCE OF ALBERTA
LEGEND
COLD LAKE BEAVER RIVER BASIN BOUNDARY
SUB-BASIN BOUNDARIES
COLD LAKE
AIR WEAPONS RANGE
SAND RIVER
COLD RIVER
FOURTH MERIDIAN
Primrose Lake
Caribou Lake
Cold Lake
UPPER BEAVER RIVER
MANATOKAN CREEK
JACKFISH CREEK
MEDLEY RIVER
Beaver
Whitefish Lake
Muriel Lake
MOOSE LAKE
PROVINCE OF SASKATCHEWAN
KILOMETRES
MILES
0
10
20
30
40
50
0
10
20
30
N

Figure 3: Portion of Cold Lake - Beaver River Basin Covered by Map Sheet 73-L

cottages, campsites or provincial parks nearby, and Trophy lakes are all heavily used by anglers. The more popular angling lakes include Seibert, Wolf, Moose, Moore, Muriel, Kehiwin, Touchwood, Pinehurst, Garner, Long, Beaver, Ironwood and Elinor lakes.

Angling licence sales, indicating angler interest and activity, have increased sharply in the Cold Lake - Beaver River Basin in recent years. Table I indicates the actual angling licence sales for the Basin, and the percent increase over previous figures for three years.

TABLE I. ANGLING LICENCE SALES IN THE COLD LAKE - BEAVER RIVER BASIN.

Year	1972-73	1977-78	1980
Angling Licences Sold	3,316	4,829	7,787
Percent Increase		45.6%	61.3%

These licence sales reflect, on a small scale, the increasing interest in sportfishing recreation shown by all residents of Alberta. Provincial angling licence sales between 1970-71 and 1980-81 showed an increase of 104%. Based on licence sale trends and population trends prior to 1977, provincial angling licence sales are projected to reach at least 550,000 by the year 2000 (Figure 4).

The sale of special Trophy Lake angling licences has increased dramatically since 1970, indicating a shift in angler interest to quality sportfishing experiences. Seibert Lake is the most accessible and most popular Trophy Lake in Alberta (Bishop, 1971), and presumably receives a considerable amount of the angling activity represented by Trophy Lake angling licence sales (Table II).

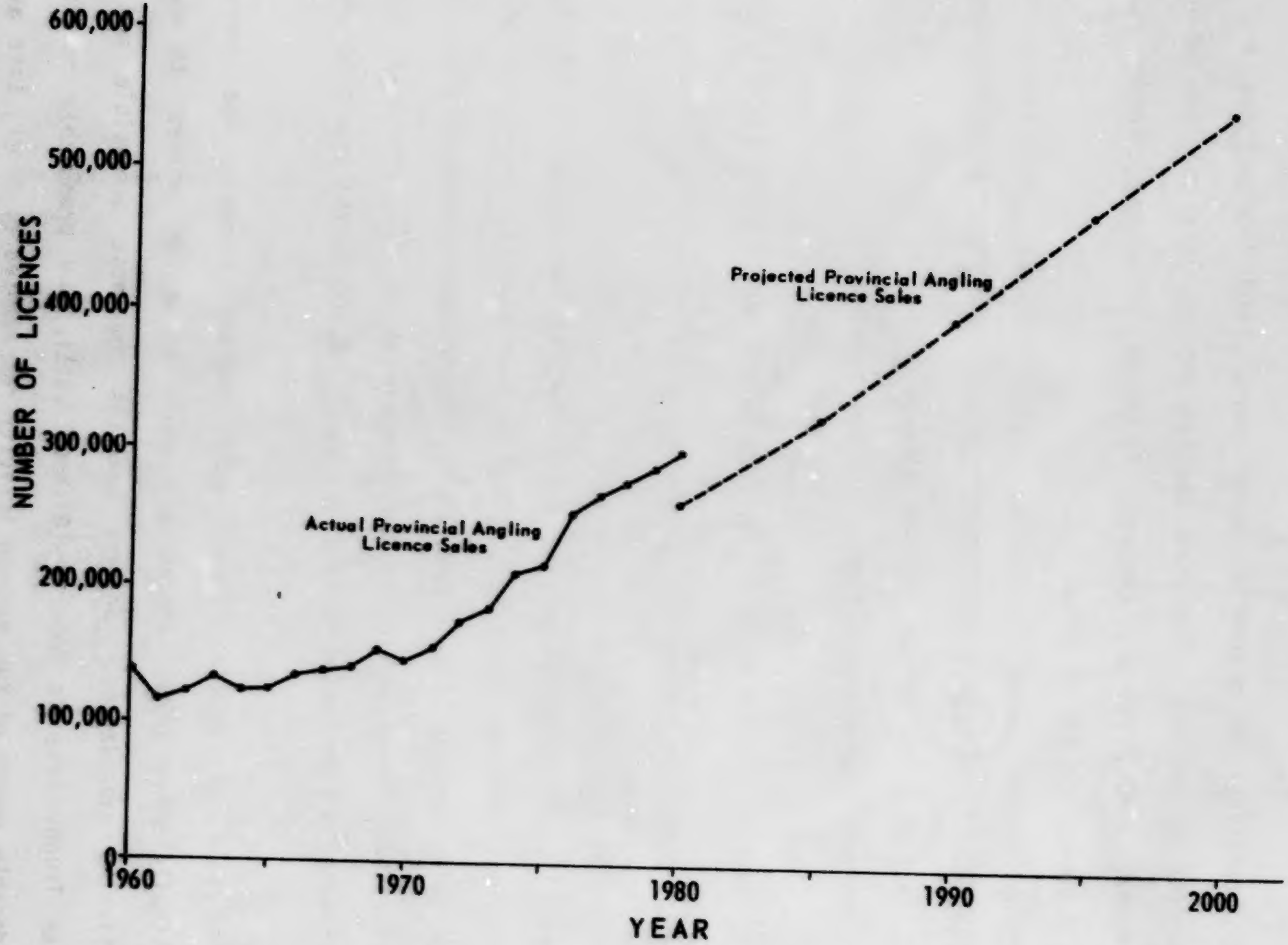


Figure 4: Angling Licence Sales and Projected Sales for the Province.

TABLE II TROPHY LAKE LICENCE SALES IN ALBERTA, 1970-71 TO 1979-80

Year	70-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80
Licences Sold	282	411	806	1017	1219	1963	2512	3088	3391	4127

A study by Carss et al (1978), found that licenced anglers represented only 69% of all anglers. No licences are required by anglers under 16 years of age, or over 65 years of age, and yet they represent 31% of the angling population. The angling sales presented in this report therefore indicate minimum levels of demand.

Although local residents account for much of the sportfishing activity in the Cold Lake - Beaver River Basin, many other anglers travel considerable distances to fish the lakes in the Basin. Moller (1972) discovered that 56.1% of 533 vehicles censussed near major lakes in the Basin belonged to anglers residing 161 km (100 mi) or more from the lake.

Angling activity in the Alberta Energy and Natural Resources Northeast Administrative Region, which includes the Cold Lake - Beaver River Basin, totalled 1,500,309 man-days in 1980, representing 33.7% of all sportfishing activity in the province (Table III a). Most (86%) of these man-days of angling were accounted for by residents of the same region (Table III b; Figure 5).

TABLE III a. MAN-DAYS OF ANGLING BY ALBERTANS IN THE ENERGY AND NATURAL RESOURCES ADMINISTRATIVE REGIONS, AND BANFF AND JASPER NATIONAL PARKS IN 1980.

Region	Man-Days	% of Total
Peace River	361,508	(8.1%)
Jasper	86,725	(1.9%)
Eastern Slopes	885,766	(19.9%)
Banff	125,060	(2.8%)
Athabasca	165,016	(3.7%)
NORTHEAST	1,500,309	(33.7%)
Central	781,238	(17.6%)
Southern	545,230	(12.3%)
Provincial Total	4,450,852	(100%)

TABLE III b. MAN-DAYS OF ANGLING BY ALBERTANS IN THE NORTHEAST ADMINISTRATIVE REGION BY RESIDENTS OF ALL ADMINISTRATIVE REGIONS, 1980

Region	Man-Days of Angling	% of Total
Peace River	15,393	(1.0%)
Eastern Slopes	18,994	(1.3%)
Athabasca	7,858	(0.5%)
NORTHEAST	1,294,400	(86.3%)
Central	145,050	(9.7%)
Southern	18,614	(1.2%)
Northeast Region Total	1,500,309	(100%)

The supply of fish, and fish-producing waters necessary to meet this recreational demand are relatively fixed quantities, determined by the availability of high quality aquatic habitat. Only 2.5% (16,796 km^2) of Alberta's total area (661,185 km^2) is covered by water (Canada Year Book 1978-79), and much of this area is incapable of fish production because of shallow depth or undesirable water quality. To meet the increasing demand for

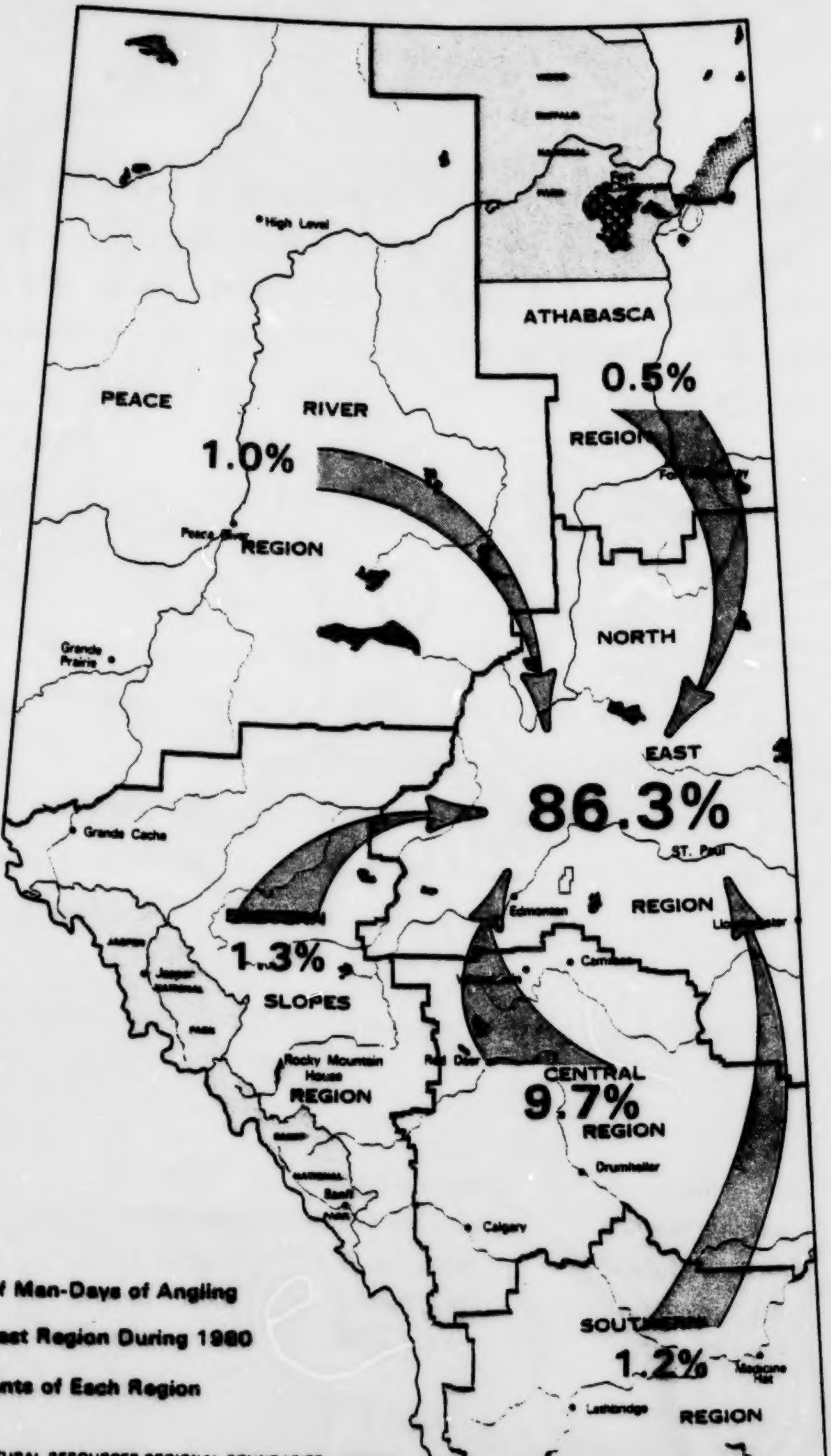

ATHABASCA
REGION
0.5%
PEACE
RIVER
REGION
1.0%
High Level
Peace River
Grande Prairie
NORTH
EAST
86.3%
REGION
St. Paul
Edmonton
Lloydminster
Camrose
Grande Cache
Jasper
1.3%
SLOPES
REGION
Rocky Mountain House
Red Deer
CENTRAL
9.7%
REGION
Drumheller
Calgary
Banff
SOUTHERN
1.2%
Medicine Hat
Lethbridge
REGION

Figure 5:

Percent of Man-Days of Angling in Northeast Region During 1980 by Residents of Each Region

ENERGY AND NATURAL RESOURCES REGIONAL BOUNDARIES ——

recreational fishing, it is necessary to maintain existing fish-producing waters, to improve the biological productivity of these waters, to initiate fish production in some of the currently barren waters, and to create new waters capable of fish production.

COMMERCIAL FISHING

Thirty-three lakes in the Cold Lake - Beaver River Basin are commercially fished. Commercially caught fish - including whitefish, trout, tullibee, perch, pike and walleye - are sold primarily as fresh fish in Alberta. Some of the less popular species (ling and suckers) are sold as mink food to local ranchers. Recently, roe taken from harvested whitefish has become a valuable product, and is marketed as a delicacy in Alberta and abroad.

Most of the lakes in Commercial Fishing Zones C and D, which encompass the Cold Lake - Beaver River Basin, have been commercially fished since the early part of this century, although harvest records are only available from 1942. Of a total of 102 lakes that have been commercially fished in both zones, 54 have been fished since 1971 (listed below). The extent of Zones C and D, and the location of those lakes in the Cold Lake-Beaver River Basin that have been commercially fished since 1971 are illustrated in Figure 6.

Commercially Fished Lakes in the Cold Lake-Beaver River Basin (1970-71 to 1980-81):

Zone C

Bangs Lake
Bourque Lake
Burnt Lake
Cold Lake
Ethel Lake
Muriel Lake
Primrose Lake
Reita Lake
Spencer Lake
Thompson Lakes

Zone D

Amisk Lake
Beaver Lake
Chump Lake
Elinor Lake
Fork Lake
North Buck Lake
Pinehurst Lake
Skeleton Lake
Tawakwato Lake
Touchwood Lake

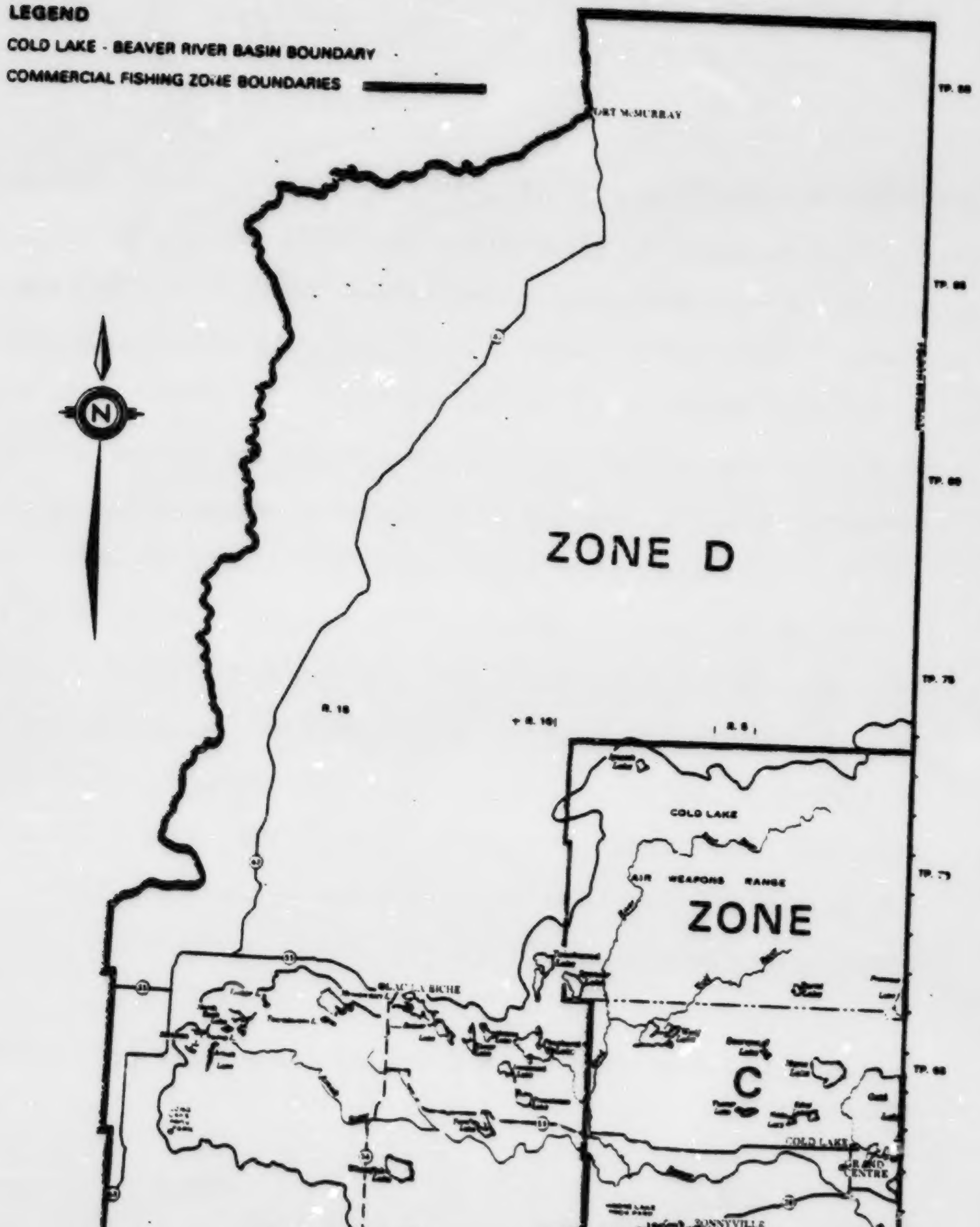

LEGEND
COLD LAKE - BEAVER RIVER BASIN BOUNDARY
COMMERCIAL FISHING ZONE BOUNDARIES
FORT McMURRAY
N
ZONE D
R. 15
R. 10
R. 5
COLD LAKE
AIR WEAPONS RANGE
ZONE
C
LAC LA BICHE
COLD LAKE
GRAND CENTRE
BONNYVILLE
ELK POINT
SCALE 1 : 1 500 000
0 10 20 30 40 50 KILOMETRES
0 10 20 30 MILES

Figure 6: Commercially Fished Lakes in the Cold Lake - Beaver River Basin

Hilda Lake
Ipiatik Lake
Kehiwin Lake
Marie Lake
Moose Lake
Tucker Lake
Wolf Lake
Frenchman Lake
Helena Lake
Ironwood Lake
Lodge Lake
Missawawi Lake
Whitefish Lake

Almost half of all lakes commercially fished in Zone D, and all but one of the lakes commercially fished in Zone C lie within the Cold Lake - Beaver River Basin (Table IV).

TABLE IV. COMMERCIALLY FISHED LAKES IN ZONE C AND D, AND IN THE COLD LAKE - BEAVER RIVER BASIN AREA OF EACH ZONE, 1970-71 to 1980-81

Zone	Number of Commercially Fished Fished Lakes in Each Zone	Number of these Commercially Fished Lakes in the Basin
C	18	17
D	36	16
Total	54	33

Commercial fishing licence sales for each zone (Table V) reflect the level of commercial fishing activity on these lakes.

TABLE V. COMMERCIAL FISHING LICENCE SALES FOR ZONES C AND D, 1970-71 TO 1980-81

	70-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81
C	54	107	99	93	78	99	77	78	79	75	106
D	157	84	87	56	80	60	60	59	85	102	104

The size of the harvest, irrespective of the number of licences sold, is determined by species quotas set for each lake. The current commercial fisheries quotas on the lakes in the Cold Lake-Beaver River Basin are at maximum levels in terms of the existing productivity of the fish species populations.

A substantial proportion of the mean annual harvests from Zones C and D consists of harvests from the lakes in the Cold Lake - Beaver River Basin. Between 1975-76 and 1980-81, the mean annual combined harvest from the commercially fished lakes in the Basin constituted 95.4% of the mean annual harvest from Zone C, and 20.6% of the mean annual harvest from Zone D. This figure (20.6%) actually represents approximately 2/3 of the mean annual harvest from all lakes in Zone D apart from Lac La Biche, which alone constituted 70.9% of the mean annual harvest.

Between 1970-71 and 1980-81, 4,128,131 kg (9,092,799 lb) of fish were harvested from the lakes in the Cold Lake - Beaver River Basin, at a market value of $4,570,653 and a value to fishermen of $2,613,349. For the same period, the annual commercial fisheries harvest from the Basin totalled 375,285 kg (826,618 lb), representing 16.8% of the average annual provincial harvest. Annual commercial harvests and values for the Cold Lake - Beaver River Basin between 1970-71 and 1980-81 are shown in Tables VI, VII and VIII. Mean species harvests and values from the Cold Lake - Beaver River Basin between 1970-71 and 1980-81 are shown in Table IX (annual species harvests and values are listed in Tables XLVI to LIV, Appendix).

TABLE VI
COMMERCIAL FISHERIES PRODUCTION FROM COLD LAKE - BEAVER RIVER BASIN, 1970 - 1971 to 1980 - 1981

Year	Unit	Quantity of Fish Produced from Cold Lake - Beaver River Basin	Production from Cold Lake - Beaver River Basin as % of Provincial Commercial Fisheries Production
1970-71	kg	513,294	16.4%
	lb	(1,130,604)	
1971-72	kg	365,741	15.1%
	lb	(805,596)	
1972-73	kg	382,664	17.3%
	lb	(842,873)	
1973-74	kg	412,707	19.8%
	lb	(909,047)	
1974-75	kg	358,717	15.1%
	lb	(790,126)	
1975-76	kg	345,698	17.8%
	lb	(761,449)	
1976-77	kg	374,268	19.0%
	lb	(824,379)	
1977-78	kg	341,505	16.1%
	lb	(752,214)	
1978-79	kg	311,663	15.2%
	lb	(686,482)	
1979-80	kg	344,072	17.1%
	lb	(757,868)	
1980-81	kg	377,800	15.2%
	lb	(832,159)	
Mean	kg	375,285	16.8%
	lb	(826,618)	

TABLE VII

MARKET VALUE OF COMMERCIAL FISHERIES PRODUCTION FROM COLD LAKE - BEAVER RIVER BASIN, 1970 - 1971 to 1980 - 1981

Year	Market Value of Commercial Fisheries Production from Cold Lake - Beaver River Basin	Market Value of Production from Cold Lake Beaver River Basin as % of Market Value of Provincial Commercial Fisheries Production
1970-71	$ 398,400	25.1%
1971-72	$ 333,485	23.6%
1972-73	$ 342,031	23.2%
1973-74	$ 351,536	24.5%
1974-75	$ 387,648	22.1%
1975-76	$ 367,526	21.7%
1976-77	$ 500,377	23.1%
1977-78	$ 398,331	18.3%
1978-79	$ 361,928	15.2%
1979-80	$ 544,656	19.3%
1980-81	$ 584,734	17.7%
Mean	$ 415,514	21.3%

TABLE VIII

VALUE TO FISHERMEN OF COMMERCIAL FISHERIES PRODUCTION FROM COLD LAKE - BEAVER RIVER BASIN, 1970 - 1971 to 1980 - 1981

Year	Value to Fishermen of Commercial Fisheries Production from Cold Lake - Beaver River Basin	Value to Fishermen of Production from Cold Lake - Beaver River Basin as % of Value to Fishermen of Provincial Commercial Fisheries Production
1970-71	$ 214,460	26.0%
1971-72	$ 178,245	24.4%
1972-73	$ 164,198	23.6%
1973-74	$ 192,652	24.0%
1974-75	$ 225,386	24.1%
1975-76	$ 235,243	24.1%
1976-77	$ 278,590	24.6%
1977-78	$ 273,293	22.4%
1978-79	$ 227,450	17.0%
1979-80	$ 304,956	17.6%
1980-81	$ 318,875	17.0%
Mean	$ 237,486	22.3%

TABLE IX
MEAN HARVEST AND VALUES OF COMMERCIALLY FISHED SPECIES IN THE COLD LAKE - BEAVER RIVER BASIN: 1970 - 1971 to 1980 - 1981

Species	Unit	Mean Harvest	% of Mean Provincial Harvest	Mean Value of Harvest to Fishermen	% of Mean Value of Provincial Harvest to Fishermen	Mean Market Value of Harvest	% of Mean Value of Provincial Harvest
Whitefish	kg	241,762	22.2%	$ 195,154	24.9%	$ 348,789	24.9%
	lb	532,515					
Tullibee	kg	57,829	10.4%	$ 9,126	9.6%	$ 11,173	7.2%
	lb	127,376					
Pike	kg	33,098	12.4%	$ 14,010	16.1%	$ 24,855	12.3%
	lb	72,903					
Ling	kg	17,960	18.4%	$ 1,847	32.3%	$ 1,908	32.4%
	lb	39,560					
Suckers	kg	13,285	14.2%	$ 1,104	40.4%	$ 1,100	33.5%
	lb	29,263					
Walleye	kg	8,078	12.8%	$ 9,552	16.2%	$ 15,020	13.4%
	lb	17,794					
Trout	kg	1,597	57.2%	$ 4,852	75.3%	$ 4,852	68.7%
	lb	3,158					
Perch	kg	1,260	11.3%	$ 870	20.4%	$ 1,424	14.6%
	lb	2,775					
Roe*	kg	1,512	53.0%	$ 3,884	34.9%	$ 23,426	52.9%
	lb	3,331					

* 1978 - 1979 to 1980 - 1981 only.

INDIAN DOMESTIC FISHING

As part of Treaty Number 6 and federal legislation, the Indians of Alberta are granted the right to fish lakes at any time of the year, provided the fish are used for domestic or animal consumption, and are not sold or used in trade. Indian Domestic fishermen must be licenced, although there is no charge for the licence; net size specifications for each lake and possession limits must be observed.

Since the numbers of fish are not required to be reported, there are no records which can be used to quantify Indian Domestic fishing harvests from lakes in the Cold Lake - Beaver River Basin. However, Indian Domestic fishing licence sales for lakes in the Basin give some indication of the level of fishing activity (Table X). Licences sold in the Basin account for an average of 44.1% of annual provincial Indian Domestic fishing licence sales (Table XI).

TABLE XI. INDIAN DOMESTIC FISHING LICENCES SOLD IN THE PROVINCE (a), AND IN THE COLD LAKE-BEAVER RIVER BASIN (b), 1970-71 to 1980-81

	70-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81
(a)	1,382	1,203	904	1,058	1,159	1,091	974	*NR	1,126	*NR	699
(b)	711	588	320	393	465	467	388	*NR	537	*NR	366
%	(51%)	(49%)	(35%)	(37%)	(40%)	(43%)	(40%)	*NR	(48%)	*NR	(52%)

*NR: No records available for these years

TABLE: X
INDIAN DOMESTIC LICENCE SALES FOR LAKES IN THE COLD LAKE - BEAVER RIVER BASIN, 1970 - 1971 to 1980 - 1981

Lake	1970-71	1971-72	1972-73	1973-74	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81
Amisk				2							
Bangs		1			1						
Beaver	102	82	33	44	42	62	40		62		40
Cold	76	74	73	78	79	102	92		97		52
Elinor	6	12	3	4	7	14	14	NO INFORMATION AVAILABLE	34	NO INFORMATION AVAILABLE	17
Ethel	3				2						2
Floatingstone	86	76	20	51	70	49	33		17		46
Fork	115	96	18	23	39	50	47		65		42
Frenchman	4	3		2	2	8	6		13		27
Goodfish	41	26	36	40	31						
Helena	5	13	13	17	38	30	24		27		12
Ironwood	1	1	6	8	11	2	4		18		19
Kehewin	35	27	19	11	20	24	17		14		9
Lone Pine											
Marie									1		1
Missawawi	1										
Moose	37	30	3	4	5	6	10		36		38
Muriel	53	34	24	19	33	54	44		68		50
North Buck	10	6		1		2			3		
Pinehurst	1	2							3		1
Rich	2	2									
Skeleton	35	28	8	13		4	2		18		4
Touchwood											1
Wayetenaw	9	10	3	18	12	6			2		1
Whitefish	88	63	61	58	73	54	54		57		33
Wolf	1						1		2		4
Total	711	588	320	393	465	467	388		537		399

FISHERIES MANAGEMENT GOALS AND OBJECTIVES

The fisheries management goal of the Alberta Fish and Wildlife Division is:

> To provide the opportunity for a recreational fishery, a commercial fishery, a domestic fishery and intrinsic enjoyment for the people of Alberta, through the perpetuation, development, equitable allocation and understanding of the fish resources of the province.

To achieve this goal, six objectives have been established:

1. To maintain and protect a maximum area of surface waters at maximum fish-producing capability.
    - by providing protection to the aquatic habitat so it maintains its fish-producing capability, through the establishment of water quality criteria and optimum instream flow requirements, and through the possible modification of land and water use practices to minimize water quality or aquatic habitat degradation.
2. To maintain all natural reproducing fish populations, and to expand fish resources into presently vacant suitable aquatic habitat to meet the present and increasing future demand for fish.
    - by establishing management systems to protect and ensure the natural reproduction and growth of fish, and to avoid over-exploitation of fish populations.

- by propagating and stocking fish into suitable lakes and ponds presently barren of fish life, and into areas where natural fish reproduction is inadequate to meet the demand for fish and fishing.
- by enhancing the production of the most desired species of fish.

3. To enhance natural aquatic habitat to develop fish-producing capabilities, or to improve existing production capabilities, and to create new fish-producing aquatic habitat.
    - by reclaiming aquatic habitat that has lost fish-producing capabilities due to past water use or land use practices.
    - by increasing the productive capability of natural waters to produce fish through aquatic habitat enhancement.
    - by creating new aquatic habitat through the development of ponds and reservoirs.
4. To provide a system for the equitable allocation of the harvestable surplus of the fish resource among users.
    - by establishing mechanisms to assure equitable allocation and distribution of the harvestable surplus of the fish resource.
5. To assure and maintain public access to the fisheries resources.
    - by establishing public access through site development and through coordination with other government agencies whose responsibilities include public access or public recreation.
6. Inform the public on the conservation and management of fish and aquatic resources.

- by providing the public with information regarding the management programs and policies governing the use, development and protection of the fish resources and the aquatic habitat.
- by providing the public with information concerning the available fishing opportunities.

IV. WATER QUALITY REQUIREMENTS FOR FISH PRODUCTION IN THE COLD LAKE - BEAVER RIVER BASIN

The following water quality criteria are based on a review of pertinent current literature (see Bibliography), and are recommended as standards for the protection of freshwater fish in the Cold Lake - Beaver River Basin (Table XII). Selection of parameters has been limited to heavy metals, dissolved gases, temperature, suspended solids, and pH. The criterion for phosphorus is based on its toxicity to fish and aquatic life; this criterion has not been recommended to control or limit eutrophication. No attempt to establish criteria for the many organic-based pesticides has been made. It is recommended that criteria for these pesticides be established in the future because of their presence in Cold Lake.

Of all the fish in the Basin, "salmonids" (including trout and whitefish) are the most sensitive to habitat and water quality change, particularly to variations in temperature and dissolved oxygen concentrations. This physiological sensitivity limits their distribution to clear, clean, cold water, and specific dissolved oxygen and temperature criteria are recommended for salmonid habitat to maintain these conditions. Measurement of water quality criteria is usually determined by the degree to which salmonids can tolerate physical or chemical alteration of their environment. Because of the sensitivity of salmonid fish, criteria protecting these species will generally protect all fish.

These water quality criteria will be the basis for determining the acceptability of levels, and changes in the concentrations of various parameters in the waters of the Cold Lake - Beaver River Basin. As the effects of these water quality parameters on fish and aquatic life are further investigated, the following criteria may be reviewed and amended.

TABLE XII ALBERTA FISH & WILDLIFE DIVISION

WATER QUALITY CRITERIA FOR THE PROTECTION OF FISH AND THE AQUATIC ENVIRONMENT

PARAMETER	MAXIMUM CONCENTRATION	REFERENCE SOURCE
Alkalinity	Concentration should not exceed 25% of natural background levels.	Thurston, R.V. et al 1979
Ammonia	0.02 mg/l as unionized ammonia	U.S.E.P.A. 1976 and McNeely, R.N. et al (Environment Canada) 1979
Arsenic	0.05 mg/l	U.S.E.P.A. 1976
Barium	1.0 mg/l	U.S.E.P.A. 1976
Beryllium	1.1 mg/l	U.S.E.P.A. 1976
Boron	10.0 mg/l	Thurston, R.V. et al 1979
Cadmium	0.001 mg/l	U.S.E.P.A. 1976
Chlorine (residual)	0.002 mg/l	U.S.E.P.A. 1976
Chromium	0.05 mg/l	I.J.C. 1977 and NAS/NAE 1973
Copper	0.04 mg/l	Alabaster, J.S. and R. Lloyd 1980
Cyanide	0.005 mg/l	U.S.E.P.A. 1976 and McNeely, R.N. et al (Environment Canada) 1979
Dissolved Gases	Concentration of any gas (except oxygen) should not exceed 110% of saturation value for a specific temperature and atmospheric pressure. Concentrations of dissolved oxygen exceeding 110% saturation value should not persist beyond 6 hours.	U.S.E.P.A. 1976 and Alberta Fish and Wildlife Division 1980

Iron	0.3 mg/l	McNeely, R.N. et al (Environment Canada) 1979
Lead	0.01 mg/l	A. Demayo et al (Environment Canada) 1980
Manganese	1.0 mg/l	Lewis, M. 1976
Mercury	0.0001 mg/l	Alberta Environment 1977
Nickel	0.25 mg/l	Taylor, M.C. et al (Environment Canada) 1979
Nitrate	30 mg/l	Westin, D.T. 1974
Nitrite	0.6 mg/l	Thurston, R.V. and R.C. Russo 1978
Oxygen (dissolved)	For all fish the minimum constant concentration is 5 mg/l. Where salmonid eggs and larvae are present the minimum concentration is 8 mg/l.	Alberta Environment 1977 and Davis, J.C. 1975
pH	6.5 - 8.5. The pH should not change by more than 0.5 units from the natural seasonal maximum or minimum.	Thurston, R.V. et al 1979
Phenols	0.001 mg/l	U.S.E.P.A. 1976
Phosphorus (Total PO_4)	0.1 mg/l	U.S.E.P.A. 1976
Selenium	0.01 mg/l	Demayo, A. et al (Environment Canada) 1979
Silver	0.0001 mg/l	Taylor, M.C. et al (Environment Canada) 1980
Sulphide (Hydrogen Sulphide)	0.002 mg/l	U.S.E.P.A. 1976

Suspended Solids	10 mg/l over natural background level	Alberta Environment 1977
Temperature	Any increase should not be more than 3°C over ambient water temperature. Temperature should not exceed 22°C for salmonid fishes and 25°C for other species of fish	Alberta Environment 1977 and Alberta Fish & Wildlife Division 1980
Zinc	0.1 mg/l	Taylor, M.C. and A. Demayo (Environment Canada) 1980

V. MAJOR FISH-PRODUCING WATERS OF THE COLD LAKE-BEAVER RIVER BASIN

Brief summaries of the fisheries and management of the major fish-producing waters of the Cold Lake-Beaver River Basin (Figure 7) are presented in Chapter V of this report (see also Table LV, Appendix). Each summary includes a brief discussion of the following points:

Fish Species Present: Unless otherwise noted, these are resident fish populations.

Sport Fishing: Campsites or parks are noted, since their presence on a lake contributes to sport fishing activity.

The ARDA rating refers to the Agricultural and Rehabilitation Act - Canada Land Inventory Rating for Sport Fish Production Capability. It is based on an analysis of the physical and chemical features of a waterbody, and provides a relative index of its sport fish-producing capability (Rhude, 1976; 1978):

- waters in Class 1 have no significant limitations on sport fish production
- waters in Class 2 have few, or minor limitations on sport fish production
- waters in Class 3 have several minor, or few serious limitations on sport fish production
- waters in Class 4 have numerous and severe limitations on sport fish production

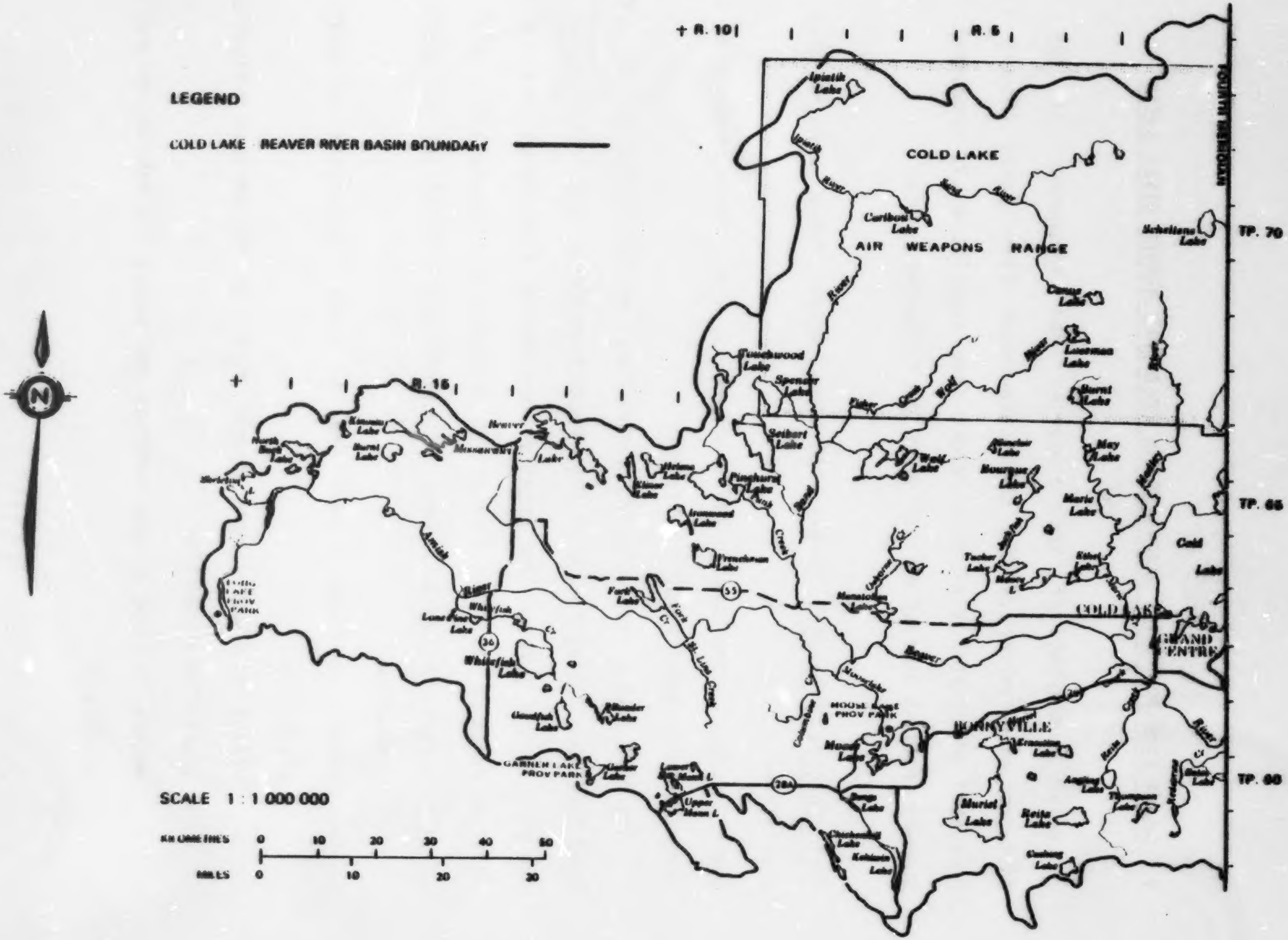

LEGEND
COLD LAKE - BEAVER RIVER BASIN BOUNDARY
SCALE 1 : 1 000 000
KILOMETRES 0 10 20 30 40 50
MILES 0 10 20 30
N
R. 10
R. 5
R. 15
FOURTH MERIDIAN
TP. 70
TP. 65
TP. 60
COLD LAKE
AIR WEAPONS RANGE
Ipiatik Lake
Caribou Lake
Canoe Lake
Burnt Lake
May Lake
Marie Lake
Cold Lake
COLD LAKE
GRAND CENTRE
BONNYVILLE
Beaver River
Touchwood Lake
Spencer Lake
Seibert Lake
Pinehurst Lake
Ironwood Lake
Frenchman Lake
Fork Lake
Manatokan Lake
Tucker Lake
Muriel Lake
Reita Lake
Moose Lake
MOOSE LAKE PROV PARK
Whitefish Lake
Lone Pine Lake
Amisk River
Garner Lake
GARNER LAKE PROV PARK
Upper Mann L.
Chickenhill Lake
Kehiwin Lake
North Buck Lake
Burnt Lake
Beaver Lake
Missawawi Lake
Long Lake
Helena Lake
Thompson Lake
Angling Lake
Ernestina Lake
Kinnaird Lake
55
36
28
28A

Figure 7: Major Fish-Producing Waterbodies of the Cold Lake - Beaver River Basin

Indian Domestic Fishing: Although catch records for the Indian Domestic fishery are not available, licence sales between 1970-71 and 1980-81 are listed for each lake to provide some indication of Indian Domestic fishing activity.

*NR indicates no records available.

Commercial Bait Fishing: Licenced bait fishermen harvest and sell forage fish (sticklebacks, minnows, trout-perch and suckers) to anglers as bait. Several of these fishermen operate on lakes in the Cold Lake-Beaver River Basin; commercial bait fishing licence sales for 1981 are listed for these lakes.

Commercial Fishing: Commercial fishing activity is described from 1942, when earliest harvest records are available.

The harvests, and values of harvests from lakes commercially fished between 1970-71 and 1980-81 are included.

The mean annual harvest from each lake commercially fished between 1975-76 and 1980-81 is expressed as a percentage of the mean annual harvest from the Zone in which the lake is located.

Commercial Fishing Quotas: Quotas are listed in pounds or kilograms as they appear in the Commercial Fishing Schedules.

These quotas are established based on a detailed analysis of the age structure of the "target", or most productive species.

Commercial fishing on a lake is closed each season when the quota for the target species, or the "tolerance" quotas for the sport fish species are met.

Estimated Annual Fish Production: These are theoretical estimates that are derived by multiplying the surface area of a lake by certain species production values in terms of pounds per/acre. These species production values, which reflect long-term average levels of production from a large number of lakes, are listed below:

5 lbs/acre whitefish
5 lbs/acre tullibee
2 lbs/acre pike
2 lbs/acre perch
0.75 lbs/acre walleye

Due to relatively high or low natural productivity of individual lakes, actual annual fish production may be more or less than the theoretical estimates.

If available, reference is made to commercial fisheries harvest records which more accurately reflect actual levels of species production in a particular lake.

Fisheries Management Objectives: Management objectives are stated for each waterbody in terms of maintained fish production for sport, domestic, or commercial utilization. Future enhancement of fish production in some waters is possible, depending on demand and technical capability.

Data Gaps: Physical, chemical and biological data gaps have been identified for each waterbody.

AMISK LAKE (64, 65-18-W4) 1,300 acres (526 ha)

Fish Species Present:

- pike, perch, walleye

Sport Fishing:

- lake is utilized by anglers; sportfishing intensity has not been quantified
- no ARDA rating

Indian Domestic Fishing:

- 2 licences sold in 1973-74

Commercial Fishing:

- records available indicate regular fishing since 1944; see Table XIII for harvest and values between 1970-71 and 1980-81.
- between 1975-76 and 1980-81, the mean annual harvest from Amisk Lake constituted 0.9% of the mean annual harvest from Zone D.

Commercial Fishing Quotas:

- 18,000 kg tullibee, or 4,500 kg whitefish, or 1,125 kg walleye, or 1,125 kg pike.

Estimated Annual Fish Production:

- 39,650 lb (18,000 kg) tullibee; 2,600 lb (1,180 kg) pike; 2,600 lb (1,180 kg) perch; 975 lb (443 kg) walleye; 6,500 lb (2,951 kg) whitefish.

Fisheries Management Objectives:

- maintain existing levels of fish production for sport, domestic and commercial utilization.

Data Gaps:

- water chemistry of lake should be determined.
- pike and walleye population age structures should be determined.
- sport fishing activity should be accurately evaluated.
- spawning and other important habitat should be located.

TABLE XIII a
COMMERCIAL FISHERIES HARVESTS FROM AMISK LAKE, 1970 - 1971 to 1980 - 1981

Species	Unit	70-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81
Whitefish	kg	1,775	3,323	2,283	1,725	681	182	136	2,982	1,180	1,180	2,256
	lb	3,910	7,319	5,028	3,800	1,500	401	300	6,568	2,600	2,600	4,970
Walleye	kg	401	301	329	204	41	7		62	57	272	98
	lb	883	664	724	450	90	16		137	125	600	215
Perch	kg	262	30	23	23			4				
	lb	578	66	50	50			10				
Pike	kg	1,078	159	349	227	75	23	23	49	113	182	91
	lb	2,375	350	768	500	165	50	50	107	250	400	200
Tullibee	kg	11,021	5,066	14,137	12,939	1,475	363	91	4,548	3,632	2,270	2,361
	lb	24,275	11,159	31,139	28,500	3,250	800	200	10,018	8,000	5,000	5,200
Ling	kg	329		102	91			113		14	227	29
	lb	724		226	200			250		30	500	65
Suckers	kg	533		410	23			14	20		23	23
	lb	1,174		904	50			30	45		50	50
Roe	kg											30
	lb											67
Total	kg	15,399	8,879	17,633	15,232	2,272	575	381	7,661	4,996	4,154	4,888
	lb	33,919	19,558	38,839	33,550	5,005	1,267	840	16,875	11,005	9,150	10,767

TABLE XIII b
DOLLAR VALUE OF COMMERCIAL FISHERIES HARVESTS FROM AMISK LAKE, 1970 - 1971 to 1980 - 1981: MARKET VALUE (VALUE TO FISHERMEN)

Species		70-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81
Whitefish	$	3,150	4,438	2,900	1,615	701	209	204	4,857	551	2,040	2,382
		(1,564)	(1,516)	(1,194)	(760)	(350)	(88)	(180)	(1,395)	(551)	(780)	(1,372)
Walleye	$	662	451	615	373	77	13		137	94	840	134
		(265)	(222)	(239)	(157)	(32)	(5)		(82)	(94)	(588)	(134)
Perch	$	173	18	20	—			8				
		(52)	(7)	(2)	—			(2)				
Pike	$	522	87	169	140	36	16	25	52	14	240	20
		(202)	(27)	(81)	(70)	(20)	(10)	(25)	(21)	(14)	(97)	(20)
Tullibee	$	1,214	558	1,404	1,140	146	160	12	801	440	275	364
		(971)	(391)	(1,404)	(1,140)	(146)	(160)	(12)	(801)	(440)	(275)	(364)
Ling	$	29		10	8			15		2	27	5
		(29)		(10)	(8)			(15)		(2)	(27)	(5)
Suckers	$	23		—	—			—	—		—	—
		(23)		—	—			—	—		—	—
Roe												$ 84
												(84)
Total	$	5,773	5,552	5,118	3,276	960	398	264	5,847	1,101	3,422	2,989
		(3,106)	(2,163)	(2,930)	(2,135)	(548)	(263)	(234)	(2,299)	(1,101)	(1,767)	(1,979)

AMISK RIVER Source: Amisk Lake (65-18-W4) Mouth: Beaver River (63-12-W4)

Fish Species Present:

- pike, perch, suckers

Sport Fishing:

- angler utlization unknown
- ARDA rating Class 2

Fisheries Management Objectives:

- none have been developed to date.

Data Gaps:

- spawning and other important habitat should be located.
- sport fishing activity should be accurately evaluated.
- fish migrations or seasonal movements should be determined.

ANGLING LAKE (60-3-W4) 1,624 acres (657 ha)

Fish Species Present:

- pike

Sport Fishing:

- lake is utilized by anglers; sportfishing intensity has not been quantified
- ARDA rating Class 2
- Alberta Transportation campsite located on lake provides access

Estimated Annual Fish Production:

- 3,200 lb (1,453 kg) pike

Fisheries Management Objectives:

- maintain existing levels of fish production for sport and domestic utilization.

Data Gaps:

- water chemistry of lake should be determined.
- fish population age structures should be determined.
- sport fishing activity should be accurately evaluated.
- spawning and other important habitat should be located.

BANGS LAKE (60-7-W4) 447 acres (181 ha)

Fish Species Present:

- pike, perch, walleye, tullibee, ling, suckers

Sport Fishing:

- lake is utilized by anglers; sportfishing intensity has not been quantified
- ARDA rating Class 2

Indian Domestic Fishing:

- 1 licence sold in 1971-72, and 1 sold in 1974-75

Commercial Fishing:

- records available indicate fishing from 1960-62 and from 1974 to present; see Table XIV for harvests and values between 1970-71 and 1980-81.
- between 1975-76 and 1980-81, the mean annual harvest from Bangs Lake constituted 1.4% of the mean annual harvest from Zone C.

Commercial Fishing Quota:

- 4,450 kg all species

Estimated Annual Fish Production:

- 800 lb (363 kg) pike; 300 lb (136 kg) walleye; 2,000 lb (908 kg) tullibee; 800 lb (363 kg) perch. Actual fish production is higher than these theoretical estimates (see commercial harvests, Table XIV a)

Fisheries Management Objectives:

- maintain existing levels of fish production for sport, domestic, and commercial utilization.

TABLE XIV a
COMMERCIAL FISHERIES HARVESTS
FROM BANGS LAKE, 1970 - 1971 to 1980 - 1981

Species	Unit	70-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81
Walleye	kg					12	10	34	41	9	74	7
	lb					26	21	74	90	20	162	15
Perch	kg					74	40	141	216	68	452	515
	lb					164	89	311	477	151	996	1,135
Pike	kg					584	387	1,771	1,964	924	2,266	2,716
	lb					1,286	853	3,901	4,326	2,035	4,991	5,982
Tullibee	kg					2	183	2,062	644	276	2,007	1,475
	lb					4	403	4,541	1,418	607	4,421	3,248
Ling	kg					100	11	120	123	38	224	58
	lb					221	24	265	271	83	494	129
Suckers	kg					2	7			16	80	87
	lb					4	15			36	176	192
Total	kg					774	638	4,128	2,988	1,331	5,103	4,858
	lb					1,705	1,405	9,092	6,582	2,932	11,240	10,701

TABLE XIV b
DOLLAR VALUE OF COMMERCIAL FISHERIES HARVESTS
FROM BANGS LAKE, 1970 - 1971 to 1980 - 1981:
MARKET VALUE (VALUE TO FISHERMEN)

Species	70-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81
Walleye					$ 22	21	86	95	25	243	44
					(20)	(14)	(59)	(68)	(25)	(243)	(30)
Perch					$ 79	45	249	370	151	996	1,135
					(66)	(40)	(249)	(267)	(151)	(996)	(1,135)
Pike					$ 432	307	1,560	1,514	712	1,996	3,708
					(421)	(299)	(584)	(665)	(712)	(1,996)	(2,991)
Tullibee					$ —	32	1,900	567	455	2,210	2,010
					—	(32)	(454)	(142)	(455)	(2,210)	(1,324)
Ling					$ 11	1	16	16	5	30	8
					(11)	(1)	(16)	(16)	(5)	(30)	(8)
Suckers					$ —	1			1	9	12
					—	(1)			(1)	(9)	(12)
Total					$ 544	407	3,811	2,562	1,349	5,484	6,917
					(518)	(387)	(1,362)	(1,158)	(1,349)	(5,484)	(5,800)

Data Gaps:

- physical features and water chemistry of the lake should be determined.
- fish population age structures should be determined.
- spawning and other important habitat should be located.
- sport fishing activity should be more accurately evaluated.

BEARTRAP LAKE (60-4-W4) 315 acres (127 ha)

Fish Species Present:

- pike, perch

Sport Fishing:

- lake is utilized by anglers; sportfishing intensity has not been quantified
- ARDA rating Class 1
- Alberta Transportation campsite located on lake provides access.

Estimated Annual Fish Production:

- 600 lb (272 kg) pike; 600 lb (272 kg) perch

Fisheries Management Objectives:

- maintain existing levels of fish production for sport and domestic utilization.

Data Gaps:

- water chemistry and physical features of the lake should be determined.
- fish population age structures should be determined.
- sport fishing activity should be accurately evaluated.
- spawning and other important habitat should be located.

BEAVER LAKE (66-13-W4) 9,230 acres (3,735 ha)

Fish Species Present:

- whitefish, pike, perch, walleye, ling, suckers

Sport Fishing:

- lake is utilized by anglers; sportfishing intensity has not been quantified
- ARDA rating Class 1
- numerous private cottages and resorts located on lake
- Alberta Transportation campsite on lake also provides access

Indian Domesic Fishing:

- licences sold between 1970-71 and 1980-81:

70-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81
102	82	33	44	42	62	40	*NR	62	*NR	40

Commercial Bait Fishing:

- 4 licences sold in 1981

Commercial Fishing:

- records available indicate regular fishing since 1942; see Table XV for harvests and values between 1970-71 and 1980-81.
- between 1975-76 and 1980-81, the mean annual harvest from Beaver Lake constituted 3.7% of the mean annual harvest from Zone D.

Commercial Fishing Quotas:

- 18,000 kg whitefish, or 900 kg pike, or 900 kg walleye

Estimated Annual Fish Production:

- 46,100 lb (20,929 kg) whitefish; 18,500 lb (8,399 kg) pike; 18,500 lb (8,399 kg) perch; 6,900 lb (3,133 kg) walleye

Fisheries Management Objectives:

- maintain existing levels of fish production for sport, domestic and commercial utilization.

TABLE XV a

COMMERCIAL FISHERIES HARVESTS FROM BEAVER LAKE, 1970 - 1971 to 1980 - 1981

Species	Unit	70-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81
Whitefish	kg	22,677	14,054	25,468	14,307	6,810	12,998	16,253	17,878	15,841	17,481	16,334
	lb	49,950	30,956	56,098	31,514	15,000	28,630	35,800	39,380	34,892	38,505	35,979
Walleye	kg	4,219	3,689	1,398	129	45	340	227	250	103	273	137
	lb	9,294	8,126	3,080	284	100	750	500	550	226	600	303
Perch	kg		64	91	3							
	lb		140	200	6							
Pike	kg	3,841	1,177	2,350	1,564	273	454	227	182	136	227	166
	lb	8,460	2,593	5,176	3,445	600	1,000	500	400	300	500	365
Ling	kg	5,848	661	2,694	4,011	681	908	681	454	91	908	73
	lb	12,880	1,500	5,934	8,836	1,500	2,000	1,500	1,000	200	2,000	161
Suckers	kg	397	39	221	246		227		91	136	454	207
	lb	875	85	486	541		500		200	300	1,000	455
Total	kg	36,982	19,704	32,222	20,260	7,809	14,927	17,388	18,855	16,307	19,343	16,917
	lb	81,459	43,400	70,974	44,626	17,200	32,880	38,300	41,530	35,918	42,605	37,263

TABLE XV b

DOLLAR VALUE OF COMMERCIAL FISHERIES HARVESTS FROM BEAVER LAKE, 1970 - 1971 to 1980 - 1981: MARKET VALUE (VALUE TO FISHERMEN)

Species		70-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81
Whitefish	$	29,639	17,908	30,780	18,146	8,400	13,630	24,344	26,864	20,760	29,457	25,992
		(18,057)	(9,379)	(13,555)	(8,272)	(3,675)	(7,745)	(10,113)	(10,602)	(8,457)	(10,441)	(10,475)
Walleye	$	6,041	4,997	2,468	340	64	600	575	632	226	870	424
		(3,378)	(2,699)	(883)	(238)	(34)	(375)	(250)	(303)	(172)	(450)	(194)
Perch	$		56	80	2							
			(15)	(17)	(1)							
Pike	$	1,873	586	1,342	954	180	330	230	192	131	231	208
		(791)	(270)	(438)	(519)	(80)	(60)	(20)	(20)	(15)	(100)	(65)
Ling	$	515	60	237	365	75	80	60	50	10	100	11
		(387)	(60)	(237)	(365)	(75)	(80)	(60)	(50)	(10)	(100)	(11)
Suckers	$	25	—	—		—		—	—	—	—	—
		(25)	—	—		—		—	—	—	—	—
Total	$	38,093	23,607	34,907	19,807	8,719	14,640	25,209	27,738	21,127	30,658	26,635
		(22,638)	(12,423)	(15,130)	(9,395)	(3,864)	(8,260)	(10,443)	(10,975)	(8,654)	(11,091)	(10,745)

Data Gaps:

- fish population age structures, especially walleye, should be determined.
- sport fishing activity should be accurately evaluated.
- spawning and other important habitat should be located.
- water chemistry of lake should be determined.

BEAVER RIVER Source: Beaver Lake (66-13-W4) Mouth: leaves Alberta (61-1-W4)

Fish Species Present:

- pike, perch, walleye, suckers

Sport Fishing:

- lake is utilized by anglers; sportfishing intensity has not been quantified
- no ARDA rating

Fisheries Management Objectives:

- none have been developed to date

Data Gaps:

- spawning and other important habitat should be located.
- sport fishing activity should be accurately evaluated.
- the status of crayfish (Orconectes virilis Hagen) should be further investigated. In Alberta, this species has only been documented in the Beaver River system (Aiken, 1967; 1968).
- fish migrations or seasonal movements should be determined.

BOURQUE LAKE (65-4-W4) 1,279 acres (518 ha)

Fish Species Present:

- whitefish, pike, perch, walleye, tullibee, ling, suckers

Sport Fishing:

- lake is utilized by anglers; sportfishing intensity has not been quantified
- ARDA rating Class 1
- noted for its large pike (over 8 lbs)

Commercial Fishing:

- records available indicate regular fishing since 1945; see Table XVI for harvests and values between 1970-71 and 1980-81.
- between 1975-75 and 1980-81, the mean annual harvest from Bourque Lake constituted 0.4% of the mean annual harvest from Zone C.

Commercial Fishing Quotas:

- 4,550 kg whitefish, or 675 kg pike, or 250 kg walleye

Estimated Annual Fish Production:

- 6,400 lb (2,910 kg) whitefish; 2,500 lb (1,135 kg) pike; 2,500 lb (1,135 kg) perch; 6,100 lb (2,769 kg) tullibee; 950 lb (431 kg) walleye

Fisheries Management Objectives:

- maintain existing levels of fish production for sport, domestic and commercial utilization

Data Gaps:

- fish population age structures should be determined
- physical features and water chemistry of the lake should be determined
- sport fishing activity should be accurately evaluated
- spawning and other important habitat should be located

BURNT LAKE (67-3-W4) 1,000 acres (405 ha)

Fish Species Present:

- whitefish, walleye, tullibee, ling, suckers

TABLE XVI a
COMMERCIAL FISHERIES HARVESTS FROM BOURQUE LAKE, 1970 - 1971 to 1980 - 1981

Species	Unit	70-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81
Whitefish	kg					1,726			1,365		323	
	lb					3,802			3,007		711	
Walleye	kg					123			145		85	
	lb					270			319		187	
Pike	kg					177			1,105		1,571	
	lb					390			2,433		3,461	
Tullibee	kg					23			68		6	
	lb					51			150		12	
Ling	kg					14			204		211	
	lb					32			450		465	
Suckers	kg								36		8	
	lb								80		18	
Total	kg					2,063			2,923		2,204	
	lb					4,545			6,439		4,854	

TABLE XVI b
DOLLAR VALUE OF COMMERCIAL FISHERIES HARVESTS FROM BOURQUE LAKE, 1970 - 1971 to 1980 - 1981: MARKET VALUE (VALUE TO FISHERMEN)

Species	70-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81
Whitefish					$ 2,091 (2,091)			2,255 (1,804)		711 (711)	
Walleye					$ 202 (202)			350 (255)		374 (374)	
Pike					$ 234 (234)			973 (973)		2,077 (2,077)	
Tullibee					$ 3 (3)			90 (90)		1 (1)	
Ling					$ 1 (1)			25 (25)		46 (46)	
Suckers					$			4 (4)		2 (2)	
Total					$ 2.531 (2.531)			3.697 (3.151)		3.211 (3.211)	

Sport Fishing:

- angler utilization unknown
- no ARDA rating
- lies in Department of National Defence Primrose Lake Air Weapons Range; access is strictly controlled

Indian Domestic Fishing:

- 1 licence sold in 1977-78

Commercial Fishing:

- records available indicate irregular fishing since 1952; see Table XVII for harvests and values between 1970-71 and 1980-81
- between 1975-76 and 1980-81, the mean annual harvest from Burnt Lake constituted 0.4% of the mean annual harvest from Zone C.

Commercial Fishing Quota:

- 2,250 kg whitefish and tullibee (combined)

Estimated Annual Fish Production:

- 5,000 lb (2,270 kg) whitefish; 5,000 lb (2,270 kg) tullibee; 750 lb (340 kg) walleye

Fisheries Management Objectives:

- maintain existing levels of fish production for sport, domestic and commercial utilization

Data Gaps:

- physical features and water chemistry of lake should be determined
- fish population age structures should be determined
- sport fishing activity should be accurately evaluated
- spawning and other important habitat should be located

TABLE XVII a

COMMERCIAL FISHERIES HARVESTS FROM BURNT LAKE (67-3-W4), 1970 - 1971 to 1980 - 1981

Species	Unit	70-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81
Whitefish	kg			2,063		3,052		284		29		483
	lb			4,543		6,722		625		64		1,065
Walleye	kg			240		121		93		4		203
	lb			529		266		205		9		448
Pike	kg	2,900		844		460		91		1		126
	lb	6,387		1,860		1,013		200		3		278
Tullibee	kg			962		2,924		1,375		196		1,791
	lb			2,118		6,441		3,028		432		3,944
Ling	kg			169		253		59		11		269
	lb			373		557		130		24		593
Suckers	kg			3								25
	lb			6								54
Total	kg	2,900		4,281		6,810		1,902		241		2,897
	lb	6,387		9,429		14,999		4,188		532		6,382

TABLE XVII b

DOLLAR VALUE OF COMMERCIAL FISHERIES HARVESTS FROM BURNT LAKE (67-3-W4), 1970 - 1971 to 1980 - 1981: MARKET VALUE (VALUE TO FISHERMEN)

Species	70-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81
Whitefish			$ 3,089 (2,044)		4,033 (4,033)		477 (375)		38 (38)		1,575 (1,065)
Walleye			$ 423 (265)		213 (213)		225 (164)		9 (9)		1,322 (896)
Pike	$ 1,405 (255)		465 (465)		405 (405)		96 (60)		1 (1)		170 (139)
Tullibee			$ 657 (525)		2,630 (1,932)		1,817 (1,817)		216 (216)		3,944 (3,944)
Ling			$ 15 (15)		28 (28)		8 (8)		1 (1)		30 (30)
Suckers			— —								3 (3)
Total	$ 1,405 (255)		4,649 (3,314)		7,309 (6,611)		2,623 (2,424)		265 (265)		7,044 (6,077)

BURNT LAKE (66-16-W4) 2,000 acres (809 ha)

Fish Species Present:

- pike

Sport Fishing:

- lake is utilized by anglers; sportfishing intensity has not been quantified
- no ARDA rating

Commercial Fishing:

- records available indicate irregular fishing between 1956 and 1970

Estimated Annual Fish Production:

- 4,000 lb (1,816 kg) pike

Fisheries Management Objectives:

- maintain existing levels of fish production for sport, domestic and commercial utilization

Data Gaps:

- physical features and water chemistry of lake should be determined
- fish population age structures should be determined
- sport fishing activity should be accurately evaluated
- spawning and other important habitat should be located

CANOE LAKE (69-3-W4) 1,164 acres (471 ha)

Fish Species Present:

- pike

Sport Fishing:

- angler utilization unknown
- ARDA rating Class 3

- lies within Department of National Defence Primrose Lake Air Weapons Range; access is strictly controlled

Estimated Annual Fish Production:

- 2,300 lb (1,044 kg) pike

Fisheries Management Objectives:

- maintain existing levels of fish production for sport and domestic utilization

Data Gaps:

- fish population age structures should be determined
- spawning and other important habitat should be located

CARIBOU LAKE (70-6-W4) 1,092 acres (442 ha)

Fish Species Present:

- pike, suckers

Sport Fishing:

- angler utilization unknown
- ARDA rating low Class 2, possible Class 3
- lies in the Department of National Defence Primrose Lake Air Weapons Range; access is strictly controlled

Estimated Annual Fish Production:

- 2,200 lb (1,000 kg) pike (conservative estimate)

Fisheries Management Objectives:

- maintain existing levels of fish production for sport and domestic utilization

Data Gaps:

- fish population age structures should be determined
- spawning and other important habitat should be located
- physical features and water chemistry of the lake should be determined

CHATWIN LAKE (61-6-W4) 180 acres (73 ha)

Fish Species Present:

- rainbow trout (stocked after chemical rehabilitation in 1962)

Sport Fishing:

- lake is utilized by anglers; sportfishing intensity has not been quantified
- ARDA rating Class 2

Estimated Annual Fish Production:

- dependent on annual stocking

Fisheries Management Objectives:

- maintain a viable rainbow trout fishery for sport utilization through continued stocking

Data Gaps:

- spawning and other important habitat should be located
- sport fishing activity should be accurately evaluated

CHICKENHILL LAKE (59-8-W4) 649 acres (263 ha)

Fish Species Present:

- pike, perch, walleye (small population)

Sport Fishing:

- angler utilization unknown
- ARDA rating Class 2
- noted for its large pike (over 8 lbs)

Estimated Annual Fish Production:

- 1,300 lb (590 kg) pike; 1,300 lb (590 kg) perch; 500 lb (227 kg) walleye

Fisheries Management Objectives:

- maintain existing levels of fish production for sport and domestic utilization

Data Gaps:

- water chemistry of the lake should be determined
- sport fishing activity should be accurately evaluated
- fish population age structures should be determined
- spawning and other important habitat should be located

CHUMP LAKE (65-18-W4) 653 acres (264 ha)

Fish Species Present:

- pike, perch, walleye, tullibee, ling

Sport Fishing:

- lake is utilized by anglers; sportfishing intensity has not been quantified
- no ARDA rating

Commercial Fishing:

- records available indicate fishing since 1942; see Table XVIII for harvests and value between 1970-71 and 1980-81.
- between 1975-76 and 1980-81, the mean annual harvest from Chump Lake constituted 0.1% of the mean annual harvest from Zone D.

TABLE XVIII a
COMMERCIAL FISHERIES HARVESTS FROM CHUMP LAKE, 1970 - 1971 to 1980 - 1981

Species	Unit	1970-71	1971-72	1972-73	1973-74	1974-75	1975-76	1976-77
Walleye	kg	828	242	49	168	182		
	lb	1,823	533	107	370	400		
Perch	kg	16	14	16		23		
	lb	35	31	35		50		
Pike	kg	179	56	204	175	204		177
	lb	395	123	450	385	450		390
Tullibee	kg	1,398	502	374	760	227		829
	lb	3,080	1,106	825	1,675	500		1,825
Ling	kg	33		16	168	45		136
	lb	72		35	370	100		300
Suckers	kg	1						227
	lb	3						500
Total	kg	2,455	814	659	1,271	681		1,369
	lb	5,408	1,793	1,452	2,800	1,500		3,015

TABLE XVIII b
DOLLAR VALUE OF COMMERCIAL FISHERIES HARVEST FROM CHUMP LAKE, 1970 - 1971 to 1980 - 1981
MARKET VALUE (VALUE TO FISHERMEN)

Species		1970-71	1971-72	1972-73	1973-74	1974-75	1975-76	1976-77
Walleye	$	1,185	400	86	296	280		
		(629)	(179)	(35)	(129)	(280)		
Perch	$	14	9	10		22		
		(3)	(3)	(1)		(10)		
Pike	$	87	29	99	145	162		186
		(34)	(10)	(47)	(77)	(135)		(20)
Tullibee	$	708	310	299	569	191		855
		(385)	(88)	(107)	(75)	(150)		(260)
Ling	$	4		2	15	—		12
		(2)		(2)	(15)	—		(12)
Suckers	$	—						—
		—						—
Total	$	1,998	748	486	1,025	655		1,053
		(1,053)	(280)	(192)	(296)	(575)		(292)

Commercial Fishing Quota:

- 3,000 lb all species

Estimated Annual Fish Production:

- 1,300 lb (590 kg) perch; 1,300 lb (590 kg) pike; 500 lb (227 kg) walleye; 3,300 lb (1,498 kg) tullibee

Fisheries Management Objectives:

- maintain existing levels of fish production for sport, domestic and commercial utilization

Data Gaps:

- fish population age structures should be determined
- spawning and other important habitat should be located
- sport fishing activity should be accurately evaluated

COLD LAKE (63,64,65-1,2-W4) 59,251 acres (23,978 ha)

Fish Species Present:

- whitefish, pike, perch, walleye, tullibee, lake trout, ling, suckers

Sport Fishing:

- lake is utilized by anglers; sportfishing intensity has not been quantified
- ARDA rating Class 1
- presence of lake trout make Cold Lake a unique angling opportunity
- Cold Lake Provincial Park and an Alberta Transportation campsite (English Bay) located on the lake provide access

Indian Domestic Fishing:

- licences sold between 1970-71 and 1980-81

70-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81
76	74	73	78	79	102	92	*NR	97	*NR	52

Commercial Fishing:

- records available indicate fishing since 1942; see Table XIX for harvests and values between 1970-71 and 1980-81
- between 1975-76 and 1980-81, the mean annual harvest from Cold Lake constituted 24.4% of the mean annual harvest from Zone C.

Commercial Fishing Quotas:

- 110,000 lb (50,000 kg) whitefish, or 500,000 lb (226,750 kg) tullibee, or 4,000 lb (1,800 kg) trout

Estimated Annual Fish Production:

- not estimated

Fisheries Management Objectives:

- continue stocking of lake trout to enhance resident population
- maintain existing levels of production of other species for sport, domestic and commercial utilization

Data Gaps:

- population age structures of species other than whitefish should be determined
- spawning and other important habitat should be located
- sport fishing activity should be accurately evaluated
- effects of pesticides on fish reproduction should be investigated
- the status of Long Bay as a fish rearing site should be investigated

COLUMBINE CREEK Source: (61-8-W4) Mouth: Beaver River (62-8-W4)

Fish Species Present:

- fish from Beaver River spawn in Columbine Creek during years of high water; no resident population

Sport Fishing:

- angler utilization unknown
- ARDA rating Class 4

TABLE XIX a
COMMERCIAL FISHERIES HARVESTS FROM COLD LAKE, 1970 - 1971 to 1980 - 1981

Species	Unit	70-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81
Whitefish	kg	35,029	45,242	27,826	71,484	46,636	43,715	39,866	26,847	34,344	30,605	37,954
	lb	77,157	99,651	61,290	157,453	102,723	96,288	87,811	59,135	75,648	67,411	83,599
Walleye	kg	96	14	27	60	7	43	45	27	41	102	280
	lb	212	32	60	133	16	95	100	59	91	225	618
Pike	kg	908	1,074	159	818	1,605	2,224	1,448	512	252	1,838	1,272
	lb	1,999	2,366	350	1,803	3,534	4,899	3,190	1,127	554	4,049	2,801
Tullibee	kg				58,868	37,111	142,014	33,290	28,652	9,534	1,435	2,617
	lb				129,665	81,742	92,542	73,325	63,110	21,000	3,162	5,765
Ling	kg	3,405	4,500	2,270	12,357	13,141	9,667	7,156	4,638	5,122	8,000	14,765
	lb	7,500	10,000	5,000	27,218	28,945	21,293	15,762	10,216	11,281	17,621	32,323
Suckers	kg	2,497	2,270	68	582	993	856	2,165	829	2,794	8,827	7,317
	lb	5,500	5,000	150	1,281	2,187	1,886	4,768	1,827	6,155	19,442	16,117
Trout	kg	1,389	802	584	2,657	1,601	2,008	1,765	1,915	1,029	1,800	2,021
	lb	3,060	1,767	1,286	5,852	3,527	4,423	3,887	4,218	2,266	3,965	4,451
Coho	kg	18		9								
	lb	40		20								
Total	kg	43,342	53,942	30,943	146,826	101,094	100,527	85,735	63,420	53,116	52,607	66,136
	lb	95,468	118,816	68,156	323,405	222,674	221,426	188,843	139,692	116,995	115,875	145,674

TABLE XIX b
DOLLAR VALUE OF COMMERCIAL FISHERIES HARVESTS FROM COLD LAKE, 1970 - 1971 to 1980 - 1981
MARKET VALUE (VALUE TO FISHERMEN)

Species	70-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81
Whitefish	$ 46,294 (21,990)	59,791 (37,236)	35,314 (17,025)	109,832 (57,324)	70,497 (44,479)	79,141 (43,052)	66,292 (32,924)	42,566 (35,438)	53,028 (30,835)	54,031 (40,742)	80,293 (59,853)
Walleye	$ 144 (74)	26 (14)	50 (30)	115 (66)	10 (10)	93 (54)	114 (60)	64 (47)	91 (91)	329 (329)	869 (734)
Pike	$ 440 (200)	520 (237)	95 (65)	549 (320)	1,033 (1,033)	1,658 (1,488)	1,396 (1,027)	338 (338)	324 (166)	2,558 (1,512)	1,438 (1,350)
Tullibee				$ 7,118 (7,118)	4,492 (4,492)	5,090 (5,090)	4,738 (4,738)	3,786 (3,786)	1,260 (1,260)	180 (180)	391 (391)
Ling	$ 300 (225)	400 (300)	470 (465)	1,166 (1,166)	1,448 (1,448)	1,065 (1,065)	803 (803)	561 (561)	463 (463)	1,500 (1,500)	1,498 (1,498)
Suckers	$ 165 (165)	150 (150)	3 (3)	10 (10)	14 (14)	68 (68)	156 (156)	98 (98)	265 (265)	1,811 (1,811)	748 (748)
Trout	$ 1,836 (1,836)	1,325 (1,325)	1,161 (1,161)	5,852 (5,852)	4,403 (4,403)	5,752 (5,752)	5,830 (5,830)	6,327 (6,327)	3,820 (3,820)	7,693 (7,693)	9,374 (9,374)
Coho	$ 20 (20)		8 (4)								
Total	$ 49,199 (24,510)	62,212 (39,262)	37,101 (18,753)	124,642 (71,356)	81,897 (55,879)	92,867 (56,569)	79,329 (45,538)	53,740 (46,595)	59,251 (36,300)	68,102 (53,767)	94,611 (73,348)

Fisheries Management Objectives:

- none have been developed to date

Data Gaps:

- spawning and other important habitat should be located
- sport fishing activity (during spawning run) should be accurately evaluated
- fish migrations or seasonal movements should be determined

CORNER LAKE (65-6-W4) 430 acres (174 ha)

Fish Species Present:

- pike from Wolf Lake spawn in Corner Lake during the spring; no resident population

Sport Fishing:

- angler utilization unknown
- ARDA rating Class 4

Estimated Annual Fish Production:

- not estimated

Fisheries Management Objectives:

- none have been developed to date

Data Gaps:

- physical features and water chemistry of the lake require determined
- spawning habitat should be located, and seasonal use of this habitat by pike should be determined
- sport fishing (during spawning) should be accurately evaluated

ELINOR LAKE (65-11-W4) 2,000 acres (809 ha)

Fish Species Present:

- whitefish, pike, perch, walleye, ling

Sport Fishing:

- lake is utilized by anglers; sportfishing intensity has not been quantified
- ARDA rating Class 2
- noted for its large perch (over 1 lb)

Indian Domestic Fishing:

- licences sold between 1970-71 and 1980-81

70-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81
6	12	3	4	7	14	14	*NR	34	*NR	17

Commercial Fishing:

- records available indicate fishing since 1943; see Table XX for harvests and values between 1970-71 and 1980-81.
- between 1975-76 and 1980-81 the mean annual harvest from Elinor Lake constituted 0.7% of the mean annual harvest from Zone D.

Commercial Fishing Quotas:

- 3,500 lb whitefish, or 1,000 lb pike, or 1,000 lb walleye

Estimated Annual Fish Production:

- 4,000 lb (1,816 kg) pike; 4,000 lb (1,816 kg) perch; 10,000 lb (4,540 kg) whitefish; 1,500 lb (681 kg) walleye

Fisheries Management Objectives:

- maintain existing levels of fish production for sport, domestic and commercial utilization

Data Gaps:

- fish population age structures should be determined
- sport fishing activity should be accurately evaluated
- spawning and other important habitat should be located

TABLE XX a

COMMERCIAL FISHERIES HARVESTS FROM ELINOR LAKE, 1970 - 1971 to 1980 - 1981

Species	Unit	70-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81
Whitefish	kg	3,202	2,951	3,333	469	1,385	1,358	1,862	148	3,314	4,865	5,156
	lb	7,052	6,500	7,342	1,032	3,050	2,990	4,100	325	7,300	10,715	11,357
Walleye	kg	242	284	633	2	273	109	227	18	100	136	479
	lb	534	626	1,395	5	600	240	500	40	220	300	1,054
Pike	kg	27	10	78	26	45	25	273	27	45	82	97
	lb	60	22	172	58	100	55	600	60	100	180	214
Tullibee	kg	34										
		75										
Ling	kg		14	4	182	45	36	45	14	23	11	5
	lb		31	8	400	100	80	100	30	50	25	12
Suckers	kg	18		10	9	11		45		23	7	7
	lb	40		22	20	25		100		50	15	15
Total	kg	3,523	3,259	4,058	688	1,759	1,528	2,452	207	3,505	5,101	5.744
	lb	7,761	7,179	8,939	1,515	3,875	3,365	5,400	455	7,720	11,235	12,652

TABLE XX b

DOLLAR VALUE OF COMMERCIAL FISHERIES HARVESTS FROM ELINOR LAKE, 1970 - 1971 to 1980 - 1981: MARKET VALUE (VALUE TO FISHERMEN)

Species	70-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81
Whitefish	$ 3,738	2,860	3,744	540	1,560	1,833	3,034	217	4,069	10,010	9,647
	(2,363)	(1,950)	(1,343)	(242)	(1,220)	(1,046)	(2,426)	(195)	(2,015)	(3,831)	(3,861)
Walleye	$ 347	469	1,116	4	510	216	500	45	147	405	1,476
	(184)	(210)	(467)	(2)	(300)	(120)	(375)	(45)	(147)	(201)	(949)
Pike	$ 13	5	41	14	30	12	261	24	20	84	131
	(5)	(2)	(16)	(6)	(25)	(12)	(75)	(15)	(20)	(36)	(42)
Tullibee	$ 4										
	(3)										
Ling		$ 1	—	16	4	4	—	2	3	1	—
		(1)	—	(16)	(4)	(4)	—	(2)	(3)	(1)	—
Suckers	$ 1		—	—					—	—	—
	(1)		—	—					—	—	—
Total	$ 4,103	3,335	4,901	574	2,104	2,605	3,795	288	4,239	10,500	11,254
	(2,556)	(2,163)	(1,826)	(266)	(1,549)	(1,182)	(2,876)	(257)	(2,185)	(4,069)	(4,852)

ERNESTINA LAKE (61-3-W4) 800 acres (324 ha)

Fish Species Present:

- pike, perch, walleye

Sport Fishing:

- lake is utilized by anglers; sportfishing intensity has not been quantified
- ARDA rating Class 1
- Municipal District and Alberta Transportation camping/recreational facilities located on lake provide access

Estimated Annual Fish Production:

- 600 lb (272 kg) walleye; 1,600 lb (726 kg) pike; 1,600 lb (726 kg) perch

Fisheries Management Objectives:

- maintain existing levels of fish production for sport and domestic utilization

Data Gaps:

- fish population age structures should be determined
- physical features and water chemistry of the lake should be determined
- sport fishing activity should be accurately evaluated
- spawning and other important habitat should be located

ETHEL LAKE (64-3-W4) 1,164 acres (471 ha)

Fish Species Present:

- whitefish, pike, perch, walleye, tullibee

Sport Fishing:

- lake is utilized by anglers; sportfishing intensity has not been quantified
- ARDA rating Class 1
- Alberta Transportation campsite located on lake provides access

Indian Domestic Fishing:

- 3 licences sold in 1970-71; 2 sold in 1974-75; 2 sold in 1980-81

Commercial Fishing:

- records available indicate regular fishing between 1952 and 1968; lake fished in alternate years from 1968-69 to present - see Table XXI for harvests and values between 1970-71 and 1980-81.
- between 1975-76 and 1980-81, the mean annual harvest from Ethel Lake constituted 0.6% of the mean annual harvest from Zone C.

Commercial Fishing Quotas:

- 6,000 lb whitefish

Estimated Annual Fish Production:

- 5,800 lb (2,633 kg) whitefish; 5,800 lb (2,633 kg) tullibee; 2,200 lb (1,000 kg) pike; 875 lb (397 kg) walleye

Fisheries Management Objectives:

- maintain existing levels of fish production for sport, domestic and commercial utilization

Data Gaps:

- fish population age structures should be determined
- spawning and other important habitat should be located
- sport fishing activity should be accurately evaluated
- effects of fluctuating water levels on fish reproduction and growth should be investigated.

FISHER CREEK　　Source: (68-5-W4)　　Mouth: Sand River (66-8-W4)

Fish Species Present:

- unknown

TABLE XXI a
COMMERCIAL FISHERIES HARVESTS FROM ETHEL LAKE, 1970 - 1971 to 1980 - 1981

Species	Unit	70-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81
Whitefish	kg	247		984		2,202	2,329		2,694		2,365	
	lb	545		2,167		4,850	5,130		5,934		5,209	
Walleye	kg			4		8	5		28		13	
	lb			9		18	10		62		29	
Perch	kg	30		2			11					
	lb	65		5			24					
Pike	kg	238		313		129	649		417		704	
	lb	525		690		284	1,430		918		1,551	
Tullibee	kg	2,753		227		70	32		29		96	
	lb	6,064		500		155	70		64		211	
Ling	kg			182		163	515		161		291	
	lb			400		359	1,135		354		642	
Suckers	kg	454		45		9	581		349		439	
	lb	1,000		100		20	1,280		770		967	
Total	kg	3,722		1,757		2,581	4,122		3,678		3,908	
	lb	8,199		3,871		5,686	9,079		8,102		8,609	

TABLE XXI b
DOLLAR VALUE OF COMMERCIAL FISHERIES HARVESTS FROM ETHEL LAKE, 1970 - 1971 to 1980 - 1981:
MARKET VALUE (VALUE TO FISHERMEN)

Species	70-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81
Whitefish	$ 300		975		2,905	2,860		4,454		3,907	
	(114)		(529)		(1,661)	(1,766)		(3,560)		(3,907)	
Walleye			$ 7		15	8		62		39	
			(3)		(6)	(3)		(62)		(39)	
Perch	$ 23		1			12					
	(8)		(1)			(3)					
Pike	$ 115		152		86	572		435		775	
	(45)		(72)		(37)	(72)		(275)		(775)	
Tullibee	$ 303		15		8	3		3		13	
	(243)		(15)		(8)	(3)		(3)		(13)	
Ling			$ 12		18	57		19		38	
			(12)		(18)	(57)		(19)		(38)	
Suckers	$ 30		2		—	—		38		58	
	(30)		(2)		--	(38)		(38)		(58)	
Total	$ 771		1,164		3,032	3,512		5,011		4,830	
	(440)		(634)		(1,730)	(1,942)		(3,957)		(4,830)	

Sport Fishing:

- angler utilization unknown
- no ARDA rating
- creek lies within Department of National Defence Primrose Lake Air Weapons Range and access is strictly controlled

Fisheries Management Objectives:

- none have been developed to date

Data Gaps:

- fish populations should be surveyed
- spawning and other habitat should be located
- fish migrations or seasonal movements should be determined

FLOATINGSTONE CREEK connects Bunder and Floatingstone Lakes (61-11,12-W4)

Fish Species Present:

- unknown; suspected pike spawning site

Sport Fishing:

- angler utilization unknown
- no ARDA rating

Fisheries Management Objectives:

- none have been developed to date

Data Gaps:

- fish populations should be surveyed
- spawning and other important habitat should be located
- sport fishing activity should be accurately evaluated
- fish migrations or seasonal movements should be determined

FLOATINGSTONE LAKE (60-11-W4) 1,473 acres (596 ha)

Fish Species Present:

- whitefish, pike. perch, walleye, ling, suckers

Sport Fishing:

- lake is utilized by anglers; sportfishing intensity has not been quantified
- ARDA rating Class 1
- Alberta Transportation campground and numerous cottages located on lake provide access

Indian Domestic Fishing:

- licences sold between 1970-71 and 1980-81

70-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81
86	76	20	51	70	49	33	*NR	17	*NR	46

Commercial Fishing:

- records available indicate irregular fishing between 1945 and 1960; has not been fished since 1960 as whitefish population now designated for Indian Domestic utilization

Estimated Annual Fish Production:

- 7,350 lb (3,337 kg) whitefish; 2,950 lb (1,339 kg) pike; 2,950 lb (1,339 kg) perch; 1,100 lb (500 kg) walleye

Fisheries Management Objectives:

- maintain existing levels of fish production for sport and domestic utilization

Data Gaps:

- fish population age structures should be determined
- spawning and other important habitat should be located
- physical features and water chemistry of the lake should be determined
- sport fishing activity should be accurately evaluated

FORK CREEK	Source: Fork Lake (63-11-W4)	Mouth: Beaver River (62-10-W4)

Fish Species Present:

- unknown; fish from Fork Lake or Beaver River suspected to spawn in the creek during the spring.

Sport Fishing:

- angler utilization unknown
- ARDA rating Class 4

Fisheries Management Objectives:

- none have been developed to date

Data Gaps:

- spawning and other important habitat should be located
- sport fishing activity should be accurately evaluated
- fish migrations or seasonal movements should be determined

FORK LAKE (63-11-W4) 3,008 acres (1,217 ha)

Fish Species Present:

- whitefish, pike, perch, ling, suckers

Sport Fishing:

- lake is utilized by anglers; sportfishing intensity has not been quantified
- ARDA rating Class 1
- Alberta Transportation campsite located on lake provides access

Indian Domestic Fishing:

- licences sold between 1970-71 and 1980-81

70-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81
115	96	18	23	39	50	47	*NR	65	*NR	42

Commercial Fishing:

- records available indicate fishing since 1943-44; see Table XXII for harvests and values between 1970-71 and 1980-81.
- between 1975-76 and 1980-81, the mean annual harvest from Fork Lake constituted 0.3% of the mean annual harvest from Zone D.

Commercial Fishing Quotas:

- 10,000 lb whitefish

Estimated Annual Fish Production:

- 6,000 lb (2,724 kg) pike; 6,000 lb (2,724 kg) perch; 15,000 lb (6,810 kg) whitefish

Fisheries Management Objectives:

- maintain existing levels of fish production for sport, domestic and commercial utilization

Data Gaps:

- fish population age structures should be determined
- physical features and water chemistry of lake should be determined
- spawning and other important habitat should be located
- sport fishing activity should be accurately evaluated

FRENCHMAN LAKE (64-10-W4) 2,750 acres (1,113 ha)

Fish Species Present:

- whitefish, pike, perch, ling

Sport Fishing:

- lake is utilized by anglers; sportfishing intensity has not been quantified
- ARDA rating Class 1
- Alberta Transportation campsite located on lake provides access

Indian Domestic Fishing:

- licences sold between 1970-71 and 1980-81:

TABLE XXII a
COMMERCIAL FISHERIES HARVESTS FROM FORK LAKE, 1970 - 1971 to 1980 - 1981

Species	Unit	70-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81
Whitefish	kg	4,227	5,057	5,110	5,039	5,085	2,270	2,452		1,246	1,353	
	lb	9,310	11,138	11,255	11,100	11,200	5,000	5,400		2,745	2,980	
Perch	kg		14		7			9				
	lb		30		15			20				
Pike	kg	159	499	583	295	454	227	91		100	109	
	lb	350	1,100	1,285	650	1,000	500	200		220	240	
Ling	kg	82	953	217	102	159	91	114		420	95	
	lb	180	2,100	478	225	350	200	250		925	210	
Suckers	kg	68	499	139	114	181	136	45		68	82	
	lb	150	1,100	307	250	400	300	100		150	180	
Roe	kg										78	
	lb										172	
Total	kg	4,536	7,022	6,049	5,557	5,879	2,724	2,711		1,834	1,717	
	lb	9,990	15,468	13,325	12,240	12,950	6,000	5,970		4,040	3,782	

TABLE XXII b
DOLLAR VALUE OF COMMERCIAL FISHERIES HARVESTS FROM FORK LAKE, 1970 - 1971 to 1980 - 1981
MARKET VALUE (VALUE TO FISHERMEN)

Species	70-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81
Whitefish	$ 4,841	6,126	5,745	6,650	7,327	2,337	3,680		1,695	2,125	
	(3,119)	(2,421)	(2,275)	(2,609)	(2,443)	(1,304)	(1,540)		(734)	(916)	
Perch		$ 12		6			13				
		(3)		(1)			(2)				
Pike	$ 77	242	283	234	297	200	88		13	160	
	(30)	(68)	(67)	(65)	(130)	(57)	(15)		(11)	(53)	
Ling	$ 9	84	19	10	16	8	10		46	12	
	(6)	(84)	(19)	(10)	(16)	(8)	(10)		(46)	(12)	
Suckers	$ 3	—	—	—	—	—	—		—	—	
	(3)	—	—	—	—	—	—		—	—	
Roe										$ 1,376	
										(215)	
Total	$ 4,930	6,464	6,047	6,900	7,640	2,545	3,791		1,754	3,673	
	(3,158)	(2,576)	(2,361)	(2,685)	(2,589)	(1,369)	(1,567)		(791)	(1,196)	

70-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81
4	3	--	2	2	8	6	*NR	13	*NR	27

Commercial Fishing:

- records available indicate fishing since 1942, see Table XXIII for harvests and values between 1970-71 and 1980-81.
- between 1975-76 and 1980-81, the mean annual harvest from Frenchman Lake constituted 1.2% of the mean annual harvest from Zone D.

Commercial Fishing Quotas:

- 3,150 kg whitefish

Estimated Annual Fish Production:

- 5,500 lb (2,497 kg) pike; 5,500 lb (2,497 kg) perch; 13,750 lb (6,242 kg) whitefish

Fisheries Management Objectives:

- maintain existing levels of fish production for sport, domestic and commercial utilization

Data Gaps:

- fish population age structures should be determined
- physical features of the lake should be determined
- sport fishing activity should be accurately evaluated
- spawning and other important habitat should be located

GARNER LAKE (60-12-W4) 1,866 acres (755 ha)

Fish Species Present:

- pike, perch, walleye

Sport Fishing:

- lake is utilized by anglers; sportfishing intensity has not been quantified

TABLE XXIII a
COMMERCIAL FISHERIES HARVESTS FROM FRENCHMAN LAKE, 1970 - 1971 to 1980 - 1981

Species	Unit	70-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81
Whitefish	kg	2,571	5,221	6,001	5,039	2,270	2,724	2,724		5,916	16,162	
	lb	5,662	11,499	13,219	11,100	5,000	6,000	6,000		13,030	35,600	
Walleye	kg		3		7	11	18	91		17	11	
	lb		7		15	25	40	200		38	25	
Perch	kg		5					91		1	2	
	lb		10					200		3	5	
Pike	kg	68	172	200	100	23	91	45		89	114	
	lb	150	380	440	220	50	200	100		195	250	
Ling	kg	79	1,226	415	697	45	91	91		613	1,051	
	lb	175	2,700	914	1,535	100	200	200		1,350	2,315	
Suckers	kg				7	68	45	23				
	lb				15	150	100	50				
Roe	kg										1,294	
	lb										2,850	
Total	kg	2,718	6,627	6,616	5,850	2,417	2,969	3,065		6,636	18,634	
	lb	5,987	14,596	14,573	12,885	5,325	6,540	6,750		14,616	41,045	

TABLE XXIII b
DOLLAR VALUE OF COMMERCIAL FISHERIES HARVESTS FROM FRENCHMAN LAKE, 1970 - 1971 to 1980 - 1981: MARKET VALUE (VALUE TO FISHERMEN)

Species	70-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81
Whitefish	$ 2,944 (1,897)	5,174 (2,478)	6,779 (3,106)	6,685 (2,609)	3,300 (1,359)	3,213 (1,604)	4,080 (1,869)		7,453 (3,474)	25,500 (10,947)	
Walleye		$ 5 (2)		12 (7)	21 (12)	32 (20)	220 (150)		28 (28)	35 (18)	
Perch		$ 3 (1)					130 (28)		— —	— —	
Pike	$ 45 (13)	84 (32)	97 (46)	70 (18)	20 (2)	60 (8)	44 (13)		49 (49)	160 (57)	
Ling	$ 7 (6)	108 (108)	36 (36)	69 (69)	5 (5)	— (8)	5 (5)		68 (68)	116 (116)	
Suckers	$			— —	— —	— —	— —				
Roe										$ 22,800 (3,562)	
Total	$ 2,996 (1,916)	5,374 (2,621)	6,912 (3,188)	6,836 (2,703)	3,346 (1,378)	3,305 (1,640)	4,479 (2,065)		7,598 (3,619)	48,611 (14,700)	

- no ARDA rating
- Provincial park and numerous cottages located on lake provide access

Commercial Bait Fishing:

- 1 licence sold in 1981

Commercial Fishing:

- the lake has not been commercially fished since 1948-49

Estimated Annual Fish Production:

- 3,750 lb (1,702 kg) pike; 3,750 lb (1,702 kg) perch; 1,400 lb (636 kg) walleye

Fisheries Management Objectives:

- maintain existing levels of fish production for sport and domestic utilization

Data Gaps:

- physical features of the lake should be determined
- sport fishing activity should be accurately evaluated
- fish population age structures should be determined
- spawning and other important habitat should be located

GOODFISH LAKE (61-12-W4) 2,062 acres (834 ha)

Fish Species Present:

- whitefish, pike, perch, walleye, tullibee, ling, suckers

Sport Fishing:

- lake is utilized by anglers; sportfishing intensity has not been quantified
- ARDA rating Class 1
- access limited as Metis colony and Indian Reserve located adjacent to lake on east and west sides.

Indian Domestic Fishing:

- licences sold between 1970-71 and 1980-81:

70-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81
41	26	36	40	31	--	--	*NR	--	*NR	--

Commercial Fishing:

- lake has not been commercially fished since 1953

Estimated Annual Fish Production:

- 4,100 lb (1,861 kg) pike; 4,100 lb (1,861 kg) perch; 10,300 lb (4,676 kg whitefish; 10,300 lb (4,676 kg) tullibee; 1,550 lb (704 kg) walleye

Fisheries Management Objectives:

- maintain existing levels of fish production for sport and domestic utilization

Data Gaps:

- physical features of the lake should be determined
- fish population age structures should be determined
- sport fishing activity should be accurately evaluated
- spawning and other important habitat should be located

GREENSTREET LAKE (60-11-W4) 180 acres (73 ha)

Fish Species Present:

- pike, perch

Sport Fishing:

- angler utilization unknown
- ARDA rating Class 4

Estimated Annual Fish Production:

- 360 lb (163 kg) pike; 360 lb (163 kg) perch

Fisheries Management Objectives:

- proposed stabilization of water levels in Greenstreet and the Mann Lakes by constructing a control structure on the outlet of Greenstreet Lake. These lakes are very shallow, and by maintaining water at a constant level, over-wintering habitat would be maximized and winterkill of fish would be minimized.
- maintain existing levels of fish production for sport and domestic utilization

Data Gaps:

- water chemistry and physical features of lake should be investigated
- fish population age structures should be determined
- spawning and other important habitat should be located
- sport fishing activity should be accurately evaluated

HASSE LAKE (64-2-W4) 121 acres (49 ha)

Fish Species Present:

- perch, rainbow trout (stocked after chemical rehabilitation in 1962)

Sport Fishing:

- lake is utilized by anglers; sportfishing intensity has not been quantified
- no ARDA rating

Estimated Annual Fish Production:

- dependent on annual stocking

Fisheries Management Objectives:

- maintain a viable rainbow trout fishery for sport utilization through continued stocking

Data Gaps:

- sport fishing activity should be accurately evaluated
- spawning and other important habitat should be located

HELENA LAKE (66-11-W4) 1,713 acres (693 ha)

Fish Species Present:

- whitefish, pike, walleye, ling

Sport Fishing:

- lake is utilized by anglers; sportfishing intensity has not been quantified
- ARDA rating Class 1

Indian Domestic Fishing:

- licences sold between 1970-71 and 1980-81:

70-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81
5	13	13	17	38	30	24	*NR	27	*NR	12

Commercial Fishing:

- records available indicate fishing since 1943; see Table XXIV for harvests and values between 1970-71 and 1980-81.
- between 1975-76 and 1980-81 the mean annual harvest from Helena Lake constituted 1.7% of the mean annual harvest from Zone D.

Commercial Fishing Quotas:

- 6,800 kg whitefish, or 570 kg pike, or 275 kg walleye

Estimated Annual Fish Production:

- 8,550 lb (3,882 kg) whitefish; 3,400 lb (1,544 kg) pike; 1,300 lb (590 kg) walleye
- these theoretical estimates are lower than actual fish production (see commercial harvests, Table XXIV a)

Fisheries Management Objectives:

- maintain existing levels of fish production for sport, domestic and commercial utilization

Data Gaps:

- physical features of the lake should be determined
- fish population age structure should be determined

TABLE XXIV a
COMMERCIAL FISHERIES HARVESTS FROM HELENA LAKE, 1970 - 1971 to 1980 - 1981

Species	Unit	70-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81
Whitefish	kg	3,011	7,082	7,048	7,757	8,399	7,264	6,992	6,901	7,763	9,252	9,475
	lb	6,631	15,600	15,525	17,086	18,500	16,000	15,400	15,200	17,100	20,378	20,870
Walleye	kg	362	273	49	91	23	23	11	34	34	35	12
	lb	798	600	108	200	50	50	25	75	75	78	26
Pike	kg	471	170	377	68	23	23	45	107	45	18	7
	lb	1,037	375	831	150	50	50	100	235	100	40	15
Ling	kg	314	118	277	23	11	45	45		91		
	lb	692	260	609	50	25	100	100		200		
Suckers	kg				4	9	45	68		23		
	lb				10	20	100	150		50		
Total	kg	4,158	7,643	7,751	7,943	8,465	7,400	7,161	7,042	7,956	9,305	9,494
	lb	9,158	16,835	17,073	17,496	18,645	16,300	15,775	15,510	17,525	20,496	20,911

TABLE XXIV b
DOLLAR VALUE OF COMMERCIAL FISHERIES HARVESTS FROM HELENA LAKE, 1970 - 1971 to 1980 - 1981:
MARKET VALUE (VALUE TO FISHERMEN)

Species	70-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81
Whitefish	$ 3,315	6,240	11,178	8,459	11,375	10,520	11,135	9,825	12,000	17,300	18,637
	(1,598)	(3,900)	(5,511)	(4,528)	(9,250)	(5,809)	(6,936)	(6,267)	(8,399)	(9,062)	(9,662)
Walleye	$ 487	408	105	170	42	45	27	75	75	65	26
	(275)	(201)	(55)	(100)	(25)	(25)	(12)	(47)	(35)	(65)	(26)
Pike	$ 228	83	260	45	16	12	55	94	25	8	1
	(75)	(48)	(87)	(38)	(13)	(12)	(25)	(43)	(25)	(8)	(1)
Ling	$ 28	10	24	2	1	5	5		10		
	(21)	(10)	(24)	(2)	(1)	(5)	(5)		(10)		
Suckers				—	—	—	—		—		
				—	—	—	—		—		
Total	$ 4,058	6,741	11,567	8,676	11,434	10,582	11,222	9,994	12,110	17,373	18,664
	(1,969)	(4,159)	(5,677)	(4,668)	(9,289)	(5,851)	(6,978)	(6,357)	(8,469)	(9,135)	(9,689)

- sport fishing activity should be accurately evaluated
- spawning and other important habitat should be located

HILDA LAKE (64-3-W4) 803 acres (321 ha)

Fish Species Present:

- pike, perch, walleye, tullibee, ling, suckers

Sport Fishing:

- lake is utilized by anglers; sportfishing intensity has not been quantified
- ARDA rating Class 1

Commercial Fishing:

- records available indicate irregular fishing since 1945; see Table XXV for harvests and values between 1970-71 and 1980-81.
- between 1975-76 and 1980-81, the mean annual harvest from Hilda Lake constituted 0.9% of the mean annual harvest from Zone C.

Commercial Fishing Quotas:

- 3,550 kg tullibee, or 900 kg pike, perch and walleye (combined)

Estimated Annual Fish Production:

- 1,600 lb (726 kg) pike; 1,600 lb (726 kg) perch; 4,000 lb (1,816 kg) tullibee; 600 lb (272 kg) walleye
- theoretical estimate for tullibee production is lower than actual production (see commercial fisheries harvests, Table XXV a)

Fisheries Management Objectives:

- maintain existing levels of fish production for sport, domestic and commercial utilization

Data Gaps:

- fish population age structures should be determined
- sport fishing activity should be accurately evaluated
- spawning and other important habitat should be located

TABLE XXV a

COMMERCIAL FISHERIES HARVESTS FROM
HILDA LAKE, 1970 - 1971 to 1980 - 1981

Species	Unit	70-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81
Walleye	kg	102			153		147		122		377	
	lb	225			336		323		268		830	
Pike	kg	34			50		157		139		51	
	lb	75			110		346		306		111	
Tullibee	kg	5,494			6,543		4,131		7,234		3,322	
	lb	12,100			14,413		9,100		15,933		7,317	
Ling	kg				25		50		14		18	
	lb				55		110		32		40	
Suckers	kg	45			93		388		224		45	
	lb	100			205		855		493		100	
Total	kg	5,675			6,864		4,873		7,733		3,813	
	lb	12,500			15,119		10,734		17,032		8,398	

TABLE XXV b

DOLLAR VALUE OF COMMERCIAL FISHERIES HARVESTS
FROM HILDA LAKE, 1970 - 1971 to 1980 - 1981
MARKET VALUE (VALUE TO FISHERMEN)

Species	70-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81
Walleye	$ 153			202		291		268		1,162	
	(68)			(202)		(194)		(161)		(705)	
Pike	$ 33			33		69		138		60	
	(7)			(22)		(69)		(63)		(43)	
Tullibee	$ 605			721		445		1,036		476	
	(363)			(721)		(445)		(1,036)		(476)	
Ling				$ 3		6		2		3	
				(3)		(6)		(2)		(3)	
Suckers	$ 3			4		17		10		—	
	(3)			(4)		(17)		(10)		—	
Total	$ 794			963		828		1,454		1,701	
	(441)			(952)		(731)		(1,272)		(1,227)	

HONEY LAKE (65-12-W4) 157 acres (63 ha)

Fish Species Present:

- perch

Sport Fishing:

- angler utilization unknown
- ARDA rating Class 4

Estimated Annual Fish Production:

- 300 lb (136 kg) perch

Fisheries Management Objectives:

- maintain existing levels of fish production for sport and domestic utilization

Data Gaps:

- physical features and water chemistry of the lake should be determined
- fish population age structures should be determined
- spawning and other important habitat should be located
- sport fishing activity should be accurately evaluated

IPIATIK LAKE (73-7-W4) 1,149 acres (465 ha)

Fish Species Present:

- whitefish, pike, ling, suckers

Sport Fishing:

- angler utilization unknown
- no ARDA rating
- Ipiatik Lake lies within the Department of National Defence Primrose Lake Air Weapons Range; access is strictly controlled

Commercial Fishing:

- records available indicate fishing since 1944; see Table XXVI for harvests and values between 1970-71 and 1980-81.
- between 1975-76 and 1980-81, the mean annual harvest from Ipiatik Lake constituted 2.0% of the mean annual harvest from Zone C.

Commercial Fishing Quotas:

- 15,000 lb whitefish

Estimated Annual Fish Production:

- 5,750 lb (2,610 kg) whitefish; 2,300 lb (1,044 kg) pike
- theoretical estimates of production are less than actual levels of production (see commercial fisheries harvests, Table XXVI a)

Fisheries Management Objectives:

- maintain existing levels of fish production for sport, domestic and commercial utilization

Data Gaps:

- water chemistry of lake should be determined
- fish population age structures should be determined
- spawning and other important habitat should be located

IRONWOOD LAKE (65-11-W4) 2,370 acres (959 ha)

Fish Species Present:

- whitefish, pike, perch, walleye, ling, suckers

Sport Fishing:

- lake is utilized by anglers; sportfishing intensity has not been quantified
- ARDA rating Class 1
- noted for its large perch (over 1 lb)
- Alberta Transportation campsite located on lake provides access

TABLE XXVI a

COMMERCIAL FISHERIES HARVESTS FROM IPIATIK LAKE, 1970 - 1971 to 1980 - 1981

Species	Unit	70-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81
Whitefish	kg	3,246	1,645	3,087	795	4,025	4,426	6,236	1,743	5,030	5,306	4,331
	lb	7,150	3,624	6,800	1,750	8,866	9,750	13,735	3,840	11,080	11,688	9,539
Pike	kg	849	45	34	11	22	27	34	35	454	1,750	1,057
	lb	1,870	100	75	25	48	60	75	77	1,000	3,854	2,328
Ling	kg	114		4						16		
	lb	250		8						35		
Suckers	kg	68	3	3	5	4	9			5		9
	lb	150	6	6	12	10	20			10		21
Total	kg	4,277	1,693	3,128	811	4,051	4,463	6,270	1,778	5,505	7,056	5,397
	lb	9,420	3,730	6,839	1,787	8,924	9,830	13,810	3,917	12,125	15,542	11,888

TABLE XXVI b

DOLLAR VALUE OF COMMERCIAL FISHERIES HARVESTS FROM IPIATIK LAKE, 1970 - 1971 to 1980 - 1981

MARKET VALUE (VALUE TO FISHERMEN)

Species	70-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81
Whitefish	$ 4,290	2,356	3,400	700	4,628	6,680	9,614	2,445	6,824	9,900	8,520
	(2,145)	(1,631)	(,3400)	(700)	(3,991)	(4,875)	(8,241)	(2,304)	(5,341)	(8,182)	(7,631)
Pike	$ 411	25	19	4	19	18	30	30	600	2,400	1,792
	(224)	(25)	(19)	(4)	(19)	(18)	(23)	(23)	(250)	(1,927)	(1,164)
Ling	$ 10		—						—		
	(8)		—						—		
Suckers	$ 4	—	—	—	—	7			—		—
	(4)	—	—	—	—	(7)			—		—
Total	$ 4,715	2,381	3,419	704	4,647	6,705	9,644	2,475	7,424	12,300	10,312
	(2,381)	(1,656)	(3,419)	(704)	(4,010)	(4,900)	(8,264)	(2,327)	(5,591)	(10,109)	(8,795)

Indian Domestic Fishing:

- licences sold between 1970-71 and 1980-81:

70-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81
1	1	6	8	11	2	4	*NR	18	*NR	19

Commercial Fishing:

- records available indicate fishing since 1942; see Table XXVII for harvests and values between 1970-71 and 1980-81.
- between 1975-76 and 1980-81, the mean annual harvest from Ironwood Lake constituted 0.8% of the mean annual harvest from Zone D.

Commercial Fishing Quotas:

- 7,000 lb whitefish or 1,000 lb walleye

Estimated Annual Fish Production:

- 11,850 lb (5,380 kg) whitefish; 4,750 lb (2,156 kg) perch; 4,750 lb (2,156 kg) pike; 1,800 lb (817 kg) walleye

Fisheries Management Objectives:

- maintain existing levels of fish production for sport, domestic and commercial utilization

Data Gaps:

- fish population age structures should be determined
- sport fishing activity should be accurately evaluated
- spawning and other important habitat should be located

JACKFISH CREEK	Source: Bourque Lake (65-4-W4)	Mouth: Beaver River (63-5-W4)

Fish Species Present:

- unknown; suspected pike spawning area

TABLE XXVII a
COMMERCIAL FISHERIES HARVESTS FROM
IRONWOOD LAKE, 1970 - 1971 to 1980 - 1981

Species	Unit	70-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81
Whitefish	kg	2,131	4,767	6,980	681	1,732	3,292	2,860	5,303	2,853	7,729	
	lb	4,693	10,500	15,374	1,500	3,815	7,250	6,300	11,681	6,285	17,025	
Walleye	kg	166	89	766	318	227	136	136	95	93	79	
	lb	366	195	1,688	700	500	300	300	210	205	175	
Perch	kg						4					
	lb						10					
Pike	kg	68	37	81	23	23	23	45	39	23	23	
	lb	150	82	178	50	50	50	100	85	50	50	
Ling	kg	159	72	251	2	114	68	114		23	123	
	lb	350	159	552	5	250	150	250		50	270	
Suckers	kg		18	64	1	45	45	45		11	29	
	lb		40	142	2	100	100	100		25	65	
Roe	kg										416	
	lb										916	
Total	kg	2,524	4,983	8,142	1,025	2,141	3,568	3,200	5,437	3,003	8,399	
	lb	5,559	10,976	17,934	2,257	4,715	7,860	7,050	11,976	6,615	18,501	

TABLE XXVII b
DOLLAR VALUE OF COMMERCIAL FISHERIES HARVESTS
FROM IRONWOOD LAKE, 1970 - 1971 to 1980 - 1981:
MARKET VALUE (VALUE TO FISHERMEN)

Species	70-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81
Whitefish	$ 2,346	4,200	8,002	910	2,423	3,382	4,552	7,710	3,870	14,500	
	(1,773)	(3,150)	(3,188)	(420)	(952)	(2,305)	(1,976)	(2,571)	(1,974)	(6,562)	
Walleye	$ 238	133	1,350	595	400	255	300	210	144	245	
	(126)	(65)	(545)	(315)	(203)	(199)	(140)	(98)	(144)	(128)	
Perch						$ 5					
						(1)					
Pike	$ 33	18	39	15	14	15	33	38	10	32	
	(13)	(7)	(19)	(5)	(2)	(2)	(5)	(9)	(10)	(11)	
Ling	$ 14	6	22	—	11	6	12		3	15	
	(12)	(6)	(22)	—	(11)	(6)	(12)		(3)	(15)	
Suckers	—	—	—	—	—	—	—		—	—	
	—	—	—	—	—	—	—		—	—	
Roe										$ 7,328	
										(1,145)	
Total	$ 2,631	4,357	9,413	1,520	2,848	3,663	4,897	7,958	4,027	22,120	
	(1,924)	(3,228)	(3,774)	(740)	(1,168)	(2,513)	(2,133)	(2,678)	(2,131)	(7,861)	

Sport Fishing:

- creek is utilized by anglers; sportfishing intensity has not been quantified
- ARDA rating Class 3

Fisheries Management Objectives:

- none have been developed to date

Data Gaps:

- spawning and other important habitat should be located
- fish migrations or seasonal movements should be determined

KEHIWIN LAKE (58-7-W4) 1,551 acres (628 ha)

Fish Species Present:

- pike, perch, walleye, tullibee, ling, suckers

Sport Fishing:

- lake is utilized by anglers; sportfishing intensity has not been quantified
- ARDA rating Class 1
- noted for its large pike (over 8 lbs)
- Alberta Transportation campsite located on lake provides access

Indian Domestic Fishing:

- licences sold between 1970-71 and 1980-81:

70-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81
35	27	19	11	20	24	17	*NR	14	*NR	9

Commercial Bait Fishing:

- 2 licences sold in 1981

Commercial Fishing:

- records available indicate fishing since 1945; see Table XXVIII for harvests and values between 1970-71 and 1980-81.
- between 1975-76 and 1980-81, the mean annual harvest from Kehiwin Lake constituted 2.8% of the mean annual harvest from Zone C.

Commercial Fishing Quotas:

- 6,800 kg tullibee, or 700 kg pike, or 700 kg walleye

Estimated Annual Fish Production:

- 7,750 lb (3,518 kg) tullibee; 3,100 lb (1,407 kg) pike; 3,100 lb (1,407 kg) perch; 1,150 lb (522 kg) walleye
- actual fish production exceeds these theoretical estimates (see commercial fisheries harvests, Table XXVIII a)

Fisheries Management Objectives:

- maintain existing levels of fish production for sport, domestic and commercial utilization

Data Gaps:

- fish population age structures should be determined
- spawning and other important habitat should be located
- sport fishing activity should be accurately evaluated

KINOSIU LAKE (66-16-W4) 2,061 acres (834 ha)

Fish Species Present:

- pike, perch

Sport Fishing:

- lake is utilized by anglers; sportfishing intensity has not been quantified
- no ARDA rating

TABLE XXVIII a
COMMERCIAL FISHERIES HARVESTS FROM KEHIWIN LAKE, 1970 - 1971 to 1980 - 1981

Species	Unit	70-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81
Walleye	kg	890	95	72	1,002	436	1,158	922		516	426	210
	lb	1,960	209	159	2,206	960	2,550	2,031		1,137	960	462
Perch	kg	23	54	8					354			
	lb	50	120	17					780			
Pike	kg	235	127	108	470	377	897	990	886	855	970	376
	lb	518	280	237	1,035	830	1,976	2,180	1,951	1,884	2,136	829
Tullibee	kg	2,200	7,514	5,060	4,546	6,794	5,406	2,532	5,016	2,629	5,863	8;746
	lb	4,846	16,550	11,145	10,014	14,964	11,908	5,576	11,048	5,790	12,914	19,264
Ling	kg	1,089	863	579		1,233	828	2,022	930	607	1,051	722
	lb	2,399	1,900	1,275		2,717	1,824	4,454	2,048	1,336	2,315	1,590
Suckers	kg		11	4		61	11	16		176		
	lb		25	10		135	25	36		388		
Total	kg	4,437	8,664	5,831	6,018	8,901	8,300	6,482	7,186	4,783	8,320	10,054
	lb	9,773	19,084	12,843	13,255	19,606	18,283	14,277	15,827	10,535	18,325	22,145

TABLE XXVIII b
DOLLAR VALUE OF COMMERCIAL FISHERIES HARVESTS FROM KEHIWIN LAKE, 1970 - 1971 to 1980 - 1981
MARKET VALUE (VALUE TO FISHERMEN)

Species	70-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81
Walleye	$ 1,196 (784)	142 (84)	127 (79)	1,765 (1,544)	797 (624)	2,295 (1,785)	2,234 (1,828)		1,137 (1,137)	1,440 (1,440)	693 (693)
Perch	$ 20 (5)	36 (12)	6 (2)					546 (195)			
Pike	$ 114 (62)	62 (42)	57 (35)	310 (207)	307 (207)	494 (494)	1,044 (872)	702 (585)	848 (848)	1,068 (1,068)	497 (497)
Tullibee	$ 1,454 (485)	4,634 (2,472)	4,513 (2,341)	3,575 (2,504)	6,274 (3,741)	4,684 (4,594)	2,641 (2,230)	552 (552)	290 (290)	839 (839)	1,348 (1,348)
Ling	$ 93 (24)	76 (76)	45 (45)		136 (136)	91 (91)	290 (290)	102 (102)	67 (67)	150 (150)	79 (79)
Suckers		$ 1 (1)	— —		7 (7)	1 (1)	1 (1)		19 (19)		
Total	$ 2,877 (1,360)	4,951 (2,687)	4,748 (2,502)	5,650 (4,255)	7,521 (4,715)	7,565 (6,965)	6,210 (5,221)	1,902 (1,434)	2,361 (2,361)	3,497 (3,497)	2,617 (2,617)

Commercial Fishing:

- fished once only in 1956-57

Estimated Annual Fish Production:

- 4,100 lb (1,861 kg) pike; 4,100 lb (1,861 kg) perch

Fisheries Management Objectives:

- maintain existing levels of fish production for sport and domestic utilization

Data Gaps:

- physical features of lake should be determined
- fish population age structures should be determined
- spawning and other important habitat should be located
- sport fishing activity should be accurately evaluated

LANE LAKE (66-4-W4) 684 acres (277 ha)

Fish Species Present:

- unknown; suspected pike spawning area

Sport Fishing:

- angler utilization unknown
- ARDA rating Class 4

Estimated Annual Fish Production:

- not estimated

Fisheries Management Objectives:

- attempt to enhance pike spawning

Data Gaps:

- spawning habitat should be located
- sport fishing activity should be accurately evaluated

LEMING LAKE (65-4-W4) 600 acres (243 ha)

Fish Species Present:

- pike, perch

Sport Fishing:

- angler utilization unknown
- ARDA rating Class 2
- accessible in winter only

Estimated Annual Fish Production:

- 1,200 lb (545 kg) pike; 1,200 lb (545 kg) perch

Fisheries Management Objectives:

- maintain existing levels of fish production for sport and domestic utilization

Data Gaps:

- physical features and water chemistry of lake should be determined
- sport fishing activity should be accurately evaluated
- spawning and other important habitat should be located
- fish population age structures should be determined

LODGE LAKE (66-17-W4) 550 acres (223 ha)

Fish Species Present:

- whitefish, pike, perch

Sport Fishing:

- lake is utilized by anglers; sportfishing intensity has not been quantified
- no ARDA rating

Commercial Fishing:

- records available indicate irregular fishing from 1942 to 1975; see Table XXIX for harvests and values from 1970-71 to 1980-81

TABLE XXIX a
COMMERCIAL FISHERIES HARVESTS FROM LODGE LAKE, 1970-1971 to 1974-1975

Species	Unit	1971 - 1972	1972 - 1973	1973 - 1974	1974 - 1975
Whitefish	kg	6,401	5,359	238	132
	lb	14,100	11,805	525	290
Pike	kg	194	197	34	41
	lb	427	433	75	90
Perch	kg	71	4		
	lb	156	9		
Total	kg	6,666	5,560	272	173
	lb	14,683	12,247	600	380

TABLE XXIX b
DOLLAR VALUE OF COMMERCIAL FISHERIES HARVESTS FROM LODGE LAKE, 1970-1971 to 1974-1975: MARKET VALUE (VALUE TO FISHERMEN)

Species	1971 - 1972	1972 - 1973	1973 - 1974	1974 - 1975
Whitefish	$3,666 (564)	472 (472)	24 (24)	14 (14)
Pike	$94 (36)	17 (17)	4 (4)	5 (5)
Perch	$47 (16)	3 --		
Total	$3,807 (616)	492 (489)	28 (28)	19 (19)

Commercial Fishing Quotas:

- 1,575 kg whitefish, or 225 kg pike

Estimated Annual Fish Production:

- 1,100 lb (500 kg) pike; 1,100 lb (500 kg) perch; 2,750 lb (1,248 kg) whitefish

Fisheries Management Objectives:

- maintain existing levels of fish production for sport, domestic and commercial utilization

Data Gaps:

- physical features and water chemistry of lake should be determined
- fish population age structures should be determined
- spawning and other important habitat should be located
- sport fishing activity should be accurately evaluated

LONE PINE LAKE (63-14-W4) 480 acres (194 ha)

Fish Species Present:

- whitefish, pike, perch, ling, suckers

Sport Fishing:

- angler utilization unknown
- no ARDA rating
- lies within Metis Colony and is only available for fishing to members of the colony

Indian Domestic Fishing:

- 2 licences sold in 1971-72

Commercial Fishing:

- records available indicate fishing for a total of only 7 years between 1945 and 1970

Estimated Annual Fish Production:

- 2,400 lb (1,090 kg) whitefish; 950 lb (431 kg) perch; 950 lb (431 kg) pike

Fisheries Management Objectives:

- maintain existing levels of fish production for commercial and domestic utilization

Data Gaps:

- fish population age structures should be determined
- physical features and water chemistry of lake should be determined
- sport fishing activity should be accurately evaluated
- spawning and other important habitat should be located

LONG LAKE (63-19-W4) 1,536 acres (622 ha)

Fish Species Present:

- pike, perch, walleye, tullibee, ling

Sport Fishing:

- lake is utilized by anglers; sportfishing intensity has not been quantified
- no ARDA rating
- Provincial Park located on lake provides access

Commercial Bait Fishing:

- 1 licence sold in 1981

Commercial Fishing:

- records available indicate fishing from 1943 to 1961

Estimated Annual Fish Production:

- 7,700 lb (3,496 kg) tullibee; 3,100 lb (1,407 kg) pike; 3,100 lb
- (1,407 kg) perch; 1,150 lb (522 kg) walleye

Fisheries Management Objectives:

- maintain existing levels of fish production for sport and domestic utilization

Data Gaps:

- physical features and water chemistry of lake should be determined
- fish population age structures should be determined
- sport fishing activity should be accurately evaluated
- spawning and other important habitat should be located

LOSEMAN LAKE (68-3-W4) 1,754 acres (710 ha)

Fish Species Present:

- pike, suckers

Sport Fishing:

- angler utilization unknown
- ARDA rating Class 3

- lake lies within Department of National Defence Primrose Lake Air Weapons Range and access is strictly controlled

Estimated Annual Fish Production:

- 3,500 lb (1,589 kg) pike

Fisheries Management Objectives:

- maintain existing levels of fish production for sport and domestic utilization

Data Gaps:

- fish population age structures should be determined
- water chemistry of lake should be determined
- spawning and other important habitat should be located

MANATOKAN CREEK

Source: Manatokan Lake (62-7-W4)
Mouth: Beaver River (63-7-W4)

Fish Species Present:

- pike (spawning only)

Sport Fishing:

- angler utilization unknown
- ARDA rating Class 3

Fisheries Management Objectives:

- none have been developed to date

Data Gaps:

- spawning and other important habitat should be located
- sport fishing activity should be accurately evaluated
- fish migrations or seasonal movements should be determined

MANATOKAN LAKE (63-7-W4) 1,048 acreas (422 ha)

Fish Species Present:

- pike, perch

Sport Fishing:

- lake is utilized by anglers; sportfishing intensity has not been quantified
- ARDA rating Class 2
- Alberta Transportation campsite located on lake provides access

Estimated Annual Fish Production:

- 2,100 lb (953 kg) pike; 2,100 lb (953 kg) perch

Fisheries Management Objectives:

- maintain existing levels of production for sport and domestic utilization

Data Gaps:

- physical features and water chemistry of lake should be determined
- fish population age structures should be determined
- sport fishing activity should be accurately evaluated
- spawning and other important habitat should be located

LOWER MANN LAKE (60-11-W4) 1,375 acres (556 ha)

Fish Species Present:

- pike, perch

Sport Fishing:

- lake is utilized by anglers; sportfishing intensity has not been quantified
- ARDA rating Class 2
- Alberta Transportation campsite located on lake provides access

Commercial Fishing:

- records available indicate fishing from 1944 - 1949.

Estimated Annual Fish Production:

- 2,750 lb (1,248 kg) pike; 2,750 lb (1,248 kg) perch

Fisheries Management Objectives:

- proposed stabilization of water levels in Greenstreet and the Mann Lakes by constructing a control structure on the outlet of Greenstreet Lake. These lakes are very shallow and by maintaining water at a constant level, overwintering habitat would be maximized, and winterkill of fish would be minimized
- maintain fish production at existing levels for sport and domestic utilization

Data Gaps:

- physical features of the lake should be determined
- fish population age structure should be determined
- sport fishing activity should be accurately evaluated

UPPER MANN LAKE (59-11-W4) 1,178 acres (477 ha)

Fish Species Present:

- pike, perch

Sport Fishing:

- lake is utilized by anglers; sportfishing intensity has not been quantified
- ARDA rating Class 1

Estimated Annual Fish Production:

- 2,350 lb (1,067 kg) pike; 2,350 lb (1,067 kg) perch

Estimated Annual Fish Production:

- proposed stabilization of water levels in Greenstreet and the Mann Lakes by constructing a control structure on the outlet of Greestreet Lake. These lakes are very shallow and by maintaining water at a constant level, overwintering habitat would be maximized, and winterkill of fish would be minimized.

- maintain fish production at existing levels for sport and domestic utilization

Data Gaps:

- physical features of the lake should be determined
- fish population age structure should be determined
- sport fishing activity should be accurately evaluated

MARIE CREEK

Source: Burnt Lake (67-3-W4)
Mouth: Beaver River (63-3-W4)

Fish Species Present:

- whitefish (spawning only), pike, walleye

Sport Fishing:

- angler utilization unknown
- ARDA rating Class 2

Fisheries Management Objectives:

- none have been developed to date

Data Gaps:

- spawning and other important habitat should be located
- sport fishing activity should be accurately evaluated
- fish migrations or seasonal movements should be determined

MARIE LAKE

(65-2-W4)
8,900 acres (3,602 ha)

Fish Species Present:

- whitefish, pike, perch, walleye, tullibee, ling, suckers

Sport Fishing:

- lake is utilized by anglers; sportfishing intensity has not been quantified
- ARDA rating Class 1
- cottages and other recreational developments along shoreline provide access

Indian Domestic Fishing:

- 1 licence sold in 1977-78; 1 sold in 1978-79; 1 sold in 1980-81

Commercial Fishing:

- records available indicate fishing from 1947-62 and from 1971 to present; see Table XXX for harvests and values between 1970-71 and 1980-81.
- between 1975-76 and 1980-81, the mean annual harvest from Marie Lake constituted 0.4% of the mean annual harvest from Zone C.

Commercial Fishing Quotas:

- 2,250 kg whitefish, or 275 kg pike, or 180 kg walleye

Estimated Annual Fish Production:

- 44,500 lb (20,203 kg) whitefish; 44,500 lb (20,203 kg) tullibee; 6,675 lb (3,030 kg) walleye; 17,800 lb (8,081 kg) pike
- these theoretical estimates are higher than actual production due to the lake's naturally low productivity

Fisheries Management Objectives:

- enhance walleye production and maintain existing levels of production of other species for sport, domestic and commercial utilization

Data Gaps:

- fish population age structures should be determined
- spawning and other important habitat should be located
- sport fishing activity should be accurately evaluated

TABLE XXX a
COMMERCIAL FISHERIES HARVESTS FROM MARIE LAKE, 1970 - 1971 to 1980 - 1981

Species	Unit	70-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81
Whitefish	kg		6,765	4,075	9,730	7,977	2,574	200				273
	lb		14,901	8,975	21,432	17,571	5,670	440				601
Walleye	kg		8	10	76	79	14					171
	lb		17	23	168	175	31					378
Pike	kg		15	19	10	34	2					431
	lb		33	42	22	75	4					950
Tullibee	kg				17							5
	lb				38							10
Ling	kg		1,309	311	617	745	281	513	23			3,133
	lb		2,883	685	1,359	1,640	618	1,130	50			6,900
Suckers	kg		350	92	314	350	164	20				3
	lb		772	202	691	770	361	45				6
Total	kg		8,447	4,507	10,764	9,185	3,035	733	23			4,016
	lb		18,606	9,927	23,710	20,231	6,684	1,615	50			8,845

TABLE XXX b
DOLLAR VALUE OF COMMERCIAL FISHERIES HARVESTS FROM MARIE LAKE, 1970 - 1971 to 1980 - 1981: MARKET VALUE (VALUE TO FISHERMEN)

Species	70-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81
Whitefish		$ 8,643	4,845	11,600	11,964	4,428	299				300
		(5,215)	(2,027)	(10,712)	(9,664)	(3,118)	(242)				(300)
Walleye		$ 12	19	126	140	31					472
		(7)	(12)	(126)	(140)	(25)					(472)
Pike		$ 8	14	7	300	2					285
		(8)	(10)	(5)	(300)	(2)					(285)
Tullibee				$ 2							1
				(2)							(1)
Ling		$ 115	14	75	82	31	62	3			379
		(86)	(14)	(75)	(82)	(31)	(62)	(3)			(379)
Suckers		$ 15	10	—	38	18	2				—
		(15)	(10)	—	(38)	(18)	(2)				—
Total		$ 8,793	4,902	11,810	12,524	4,510	363	3			1,437
		(5,331)	(2,073)	(10,920)	(10,224)	(3,194)	(306)	(3)			(1,437)

MARTINEAU RIVER

Source: Primrose Lake (Saskatchewan)
Mouth: Cold Lake (65-1-W4)

Fish Species Present:

- whitefish, pike

Sport Fishing:

- angler utilization unknown
- no ARDA rating

Fisheries Management Objectives:

- none have been developed to date

Data Gaps:

- spawning and other important habitat should be located
- sport fishing activity should be accurately evaluated
- fish migrations or seasonal movements should be determined

MAY LAKE

(66-3-W4)
776 acres (314 ha)

Fish Species Present:

- whitefish, pike, perch, walleye, tullibee, ling, suckers

Sport Fishing:

- lake is utilized by anglers; sportfishing intensity has not been quantified
- ARDA rating Class 1
- designated as a Trophy Pike Lake because of its large size pike (over 8 lbs). Lake must be fished under special licence
- access limited

Commercial Fishing:

- records available indicate irregular fishing from 1944-61

Estimated Annual Fish Production:

- 3,900 lb (1,771 kg) whitefish; 3,900 lb (1,771 kg) tullibee; 1,550 lb (704 kg) pike; 1,550 lb (704 kg) perch; 600 lb (272 kg) walleye

Fisheries Management Objectives:

- maintain reduced allowable catch regulation to promote growth of large size pike
- maintain existing levels of production of all other species for sport utilization

Data Gaps:

- fish population age structures should be determined
- sport fishing activity should be accurately evaluated
- spawning and other important habitat should be located

MEDLEY RIVER Source: (69-2-W4) Mouth: Cold Lake (65-2-W4)

Fish Species Present:

- rainbow trout (stocked)

Sport Fishing:

- river is utilized by anglers; sportfishing intensity has not been quantified
- ARDA rating Class 1

Fisheries Management Objectives:

- maintain a viable rainbow trout fishery for sport utilization through continued stocking

Data Gaps:

- spawning and other important habitat should be located
- sport fishing activity should be accurately evaluated
- fish migrations or seasonal movements should be determined

MINNIE LAKE (61-8-W4) 205 acres (83 ha)

Fish Species Present:

- pike, perch

Sport Fishing:

- lake is utilized by anglers; sportfishing intensity has not been quantified
- ARDA rating Class 1
- Alberta Transportation campsite located on lake provides access

Estimated Annual Fish Production:

- 400 lb (182 kg) pike; 400 lb (182 kg) perch

Fisheries Management Objectives:

- maintain existing levels of fish production for sport and domestic utilization

Data Gaps:

- physical features of lake should be determined
- fish population age structure should be determined
- spawning and other important habitat should be located
- sport fishing activity should be accurately evaluated

MISSAWAWI LAKE (61-15-W4) 6,400 acres (2,590 ha)

Fish Species Present:

- pike, perch, ling, suckers

Sport Fishing:

- lake is utilized by anglers; sportfishing intensity has not been quantified
- no ARDA rating
- noted for its large perch (over 1 lb)
- Alberta Transportation campsite located on lake provides access

TABLE XXXI a
COMMERCIAL FISHERIES HARVESTS FROM MISSAWAWI LAKE, 1970-71 and 1974-75

Species	Unit	1970 - 1971	1974 - 1975
Pike	kg	88	182
	lb	194	400

TABLE XXXI b
DOLLAR VALUE OF COMMERCIAL FISHERIES HARVESTS FROM MISSAWAWI LAKE, 1970-71 and 1974-75: MARKET VALUE (VALUE TO FISHERMEN)

Species	1970 - 1971	1974 - 1975
Pike	$39	18
	(16)	(18)

Indian Domestic Fishing:

- 1 licence sold in 1970-71

Commercial Fishing:

- from 1942-48, 1963-71, 1974-75; now closed to commercial fishing. Table XXXI shows harvests and values from 1970-71 to 1974-75

Estimated Annual Fish Production:

- 12,200 lb (5,539 kg) perch; 12,200 lb (5,539 kg) pike

Fisheries Management Objectives:

- maintain existing levels of fish production for sport and domestic utilization

Data Gaps:

- fish populations should be surveyed
- sport fishing activity should be accurately evaluated

- fish population age structures should be determined
- spawning and other important habitat should be located

MOORE LAKE (64-4-W4) 2,455 acres (993 ha)

Fish Species Present:

- pike, perch, walleye, tullibee, ling, suckers

Sport Fishing:

- lake is utilized by anglers; sportfishing intensity has not been quantified
- ARDA rating Class 1
- 2 Alberta Transportation campsites, other recreational facilities, and private cottages located on the lake provide access

Commercial Bait Fishing:

- 1 licence sold in 1981

Commercial Fishing:

- records available indicate fishing only in 1947-48 and 1955-56

Estimated Annual Fish Production:

- 12,300 lb (5,584 kg) tullibee; 4,900 lb (2,225 kg) pike; 4,900 lb (2,225 kg) perch; 1,850 lb (840 kg) walleye

Fisheries Management Objectives:

- maintain existing levels of fish production for sport, domestic and commercial utilization

Data Gaps:

- physical features of lake should be determined
- fish population age structures should be determined
- spawning and other important habitat should be located
- sport fishing activity should be accurately evaluated

MOOSE LAKE (61-7-W4) 9,722 acres (3,934 ha)

Fish Species Present:

- whitefish, pike, perch, walleye, tullibee, ling, suckers

Sport Fishing:

- lake is utilized by anglers; sportfishing intensity has not been quantified
- ARDA rating Class 1
- 1 Provincial Park, 4 Alberta Transportation campsites, 1 Municipal District campsite and numerous private cottages located on lake provide access

Indian Domestic Fishing:

- licences sold between 1970-71 and 1980-81:

70-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81
37	30	3	4	5	6	10	*NR	36	*NR	38

Commercial Bait Fishing:

- 6 licences sold in 1981

Commercial Fishing:

- records available indicate fishing since 1942-43; see Table XXXII for harvests and values between 1970-71 and 1980-81.
- between 1975-76 and 1980-81, the mean annual harvest from Moose Lake constituted 7.0% of the mean annual harvest from Zone C.

Commercial Fishing Quotas:

- 18,000 kg whitefish or 675 kg walleye

Estimated Annual Fish Production:

- 48,600 lb (22,064 kg) whitefish; 48,600 lb (22,064 kg) tullibee; 19,500 lb (8,853 kg) pike; 19,500 lb (8,853 kg) perch; 7,300 lb (3,314 kg) walleye

TABLE XXXII a
COMMERCIAL FISHERIES HARVESTS FROM MOOSE LAKE, 1970 - 1971 to 1980 - 1981

Species	Unit	70-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81
Whitefish	kg	3,475	2,542	3,699	6,156	10,649	12,391	11,434	19,198	18,380	15,109	19,161
	lb	7,654	5,600	8,147	13,559	23,457	27,293	25,186	42,286	40,485	33,260	42,205
Walleye	kg	1,816	1,278	125	396	150	63	442	1,153	466	429	214
	lb	4,000	2,814	275	871	330	140	973	2,539	1,026	945	472
Perch	kg		3		86							
	lb		6		190							
Pike	kg	1,591	544	441	386	198	127	233	291	508	549	422
	lb	3,504	1,198	972	851	435	280	513	640	1,120	1,210	929
Tullibee	kg	10,805	2,604	454	2,123	683		340	203	886	972	466
	lb	23,800	5,735	1,000	4,676	1,504		750	448	1,952	2,140	1,026
Ling	kg	1,915	1,964	340	1,044	272	150	109	41	182		
	lb	4,219	4,327	750	2,300	600	330	239	90	400		
Suckers	kg	418	545	227	1,040	68	57	316	154	68		
	lb	920	1,200	500	2,290	150	125	697	340	150		
Total	kg	20,020	9,480	5,286	11,231	12,020	12,788	12,874	21,040	20,490	17,059	20,263
	lb	44,097	20,880	11,644	24,737	26,476	28,168	28,358	46,343	45,133	37,575	44,632

TABLE XXXII b
DOLLAR VALUE OF COMMERCIAL FISHERIES HARVESTS FROM MOOSE LAKE, 1970 - 1971 to 1980 - 1981: MARKET VALUE (VALUE TO FISHERMEN)

Species	70-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81
Whitefish	$ 4,210	3,248	5,112	8,014	16,121	15,140	19,337	29,824	24,339	35,350	35,875
	(2,679)	(1,960)	(2,444)	(3,827)	(6,318)	(8,491)	(10,578)	(15,765)	(14,170)	(16,640)	(16,882)
Walleye	$ 2,600	2,110	220	613	264	121	973	2,539	1,026	1,181	661
	(1,400)	(1,182)	(110)	(353)	(113)	(52)	(528)	(1,559)	(451)	(1,181)	(293)
Perch		$ 2		80							
		(1)		(19)							
Pike	$ 771	264	213	218	175	99	224	275	593	715	563
	(420)	(180)	(146)	(123)	(49)	(31)	(58)	(73)	(129)	(423)	(167)
Tullibee	$ 1,190	287	40	187	45		30	27	98	107	103
	(1,071)	(201)	(40)	(187)	(45)		(30)	(27)	(98)	(107)	(103)
Ling	$ 190	151	30	92	30	16	10	5	20		
	(190)	(151)	(30)	(92)	(30)	(16)	(10)	(5)	(20)		
Suckers	$ 9	12	15	46	8	6	28	14	6		
	(9)	(12)	(15)	(46)	(8)	(6)	(28)	(14)	(6)		
Total	$ 8,970	6,074	5,630	9,250	16,643	15,382	20,602	32,684	26,082	37,353	37,202
	(5,769)	(3,687)	(2,785)	(4,647)	(6,563)	(8,596)	(11,232)	(17,443)	(14,874)	(18,351)	(17,445)

Fisheries Management Objectives:

- maintain existing levels of fish production for sport, domestic and commercial utilization

Data Gaps:

- fish population age structures should be determined
- spawning and other important habitat should be located
- sport fishing activity should be accurately evaluated

MOOSELAKE RIVER

Source: Moose Lake (61-7-W4)
Mouth: Beaver River (62-8-W4)

Fish Species Present:

- walleye, pike

Sport Fishing:

- river is utilized by anglers; sportfishing intensity has not been quantified
- ARDA rating Class 3

Fisheries Management Objectives:

- none have been developed to date

Data Gaps:

- sport fishing activity should be accurately evaluated
- spawning and other important habitat should be located
- fish migrations or seasonal movements should be determined

MURIEL CREEK Source: (61-5-W4) Mouth: Beaver River (62-2-W4)

Fish Species Present:

- none

Sport Fishing:

- angler utilization unknown
- ARDA rating Class 3

Fisheries Management Objectives:

- none have been developed to date

Data Gaps:

- significance of the river as spawning habitat should be investigated, and spawning habitat should be located.
- sport fishing activity should be accurately evaluated

MURIEL LAKE (59-5-W4) 15,610 acres (6,317 ha)

Fish Species Present:

- whitefish, pike, walleye, ling, suckers

Sport Fishing:

- lake is utilized by anglers; sportfishing intensity has not been quantified
- ARDA rating Class 1
- noted for its large pike (over 8 lbs)
- Alberta Transportation campsite located on lake provides access

Indian Domestic Fishing:

- licences sold between 1970-71 and 1980-81:

70-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81
53	34	24	19	33	54	44	*NR	68	*NR	50

Commercial Bait Fishing:

- 3 licences sold in 1981

Commercial Fishing:

- records available indicate fishing since 1942; see Table XXXIII for harvests and values between 1970-71 and 1980-81
- between 1975-76 and 1980-81, the mean annual harvest from Muriel Lake constituted 9.9% of the mean annual harvest from Zone C.

Commercial Fishing Quotas:

- 27,200 kg whitefish or 4,550 kg pike

Estimated Annual Fish Production:

- 78,100 lb (35,457 kg) whitefish; 31,200 lb (14,165 kg) pike; 11,707 lb (5,315 kg) walleye

Fisheries Management Objectives:

- possible enhancement of walleye production and maintenance of existing levels of production of other species for sport, domestic, and commercial utilization

Data Gaps:

- fish population age structures should be determined
- status of walleye should be investigated
- spawning and other important habitat should be located
- sport fishing activity should be accurately evaluated

NORTH BUCK LAKE (65-17-W4) 3,539 acres (1,432 ha)

Fish Species Present:

- whitefish, pike, perch, walleye, tullibee, ling

Sport Fishing:

- lake is utilized by anglers; sportfishing intensity has not been quantified

TABLE XXXIII a
COMMERCIAL FISHERIES HARVESTS FROM MURIEL LAKE, 1970 - 1971 to 1980 - 1981

Species	Unit	70-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81
Whitefish	kg	21,438	28,892	30,452	14,818	33,343	40,505	26,406	19,723	29,426	25,828	12,581
	lb	47,220	63,640	67,075	32,638	73,443	89,219	58,164	43,443	64,814	56,890	27,712
Walleye	kg					19	14	3	4		7	
						43	30	6	9		15	
Pike	kg	55	305	860	436	968	1,330	1,307	1,913	2,191	1,909	2,762
	lb	120	673	1,895	960	2,133	2,930	2,880	4,214	4,827	4,206	6,083
Ling	kg		772	99		1,461	1,179	192	850	261	318	47
	lb		1,700	219		3,216	2,596	423	1,872	574	700	104
Suckers	kg	2,036	1,342	4,393	3,359	396	1,603	695	1,220	1,901	397	73
	lb	4,485	2,955	9,675	7,400	873	3,531	1,530	2,686	4,188	875	160
Total	kg	23,529	31,311	35,804	18,613	36,187	44,631	28,603	23,710	33,779	28,459	15,463
	lb	51,825	68,968	78,864	40,998	79,708	98,306	63,003	52,224	74,403	62,686	34,059

TABLE XXXIII b
DOLLAR VALUE OF COMMERCIAL FISHERIES HARVESTS FROM MURIEL LAKE, 1970 - 1971 to 1980 - 1981:
MARKET VALUE (VALUE TO FISHERMEN)

Species		70-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81
Whitefish	$	28,332	33,093	37,927	16,381	42,752	57,109	41,551	28,237	38,888	48,355	41,225
		(10,411)	(19,092)	(18,494)	(7,676)	(21,191)	(32,337)	(30,245)	(26,066)	(38,888)	(30,553)	(17,251)
Walleye						$ 37	28	7	10		22	
						(28)	(17)	(5)	(7)		(22)	
Pike	$	26	148	584	246	741	1,172	1,210	1,680	2,092	2,861	3,771
		(14)	(101)	(547)	(139)	(475)	(1,153)	(772)	(1,264)	(2,092)	(2,103)	(1,992)
Ling			$ 59	11		161	107	25	103	29	35	—
			(59)	(11)		(161)	(107)	(25)	(103)	(29)	(35)	—
Suckers	$	45	30	229	148	44	352	77	148	168	44	—
		(45)	(30)	(229)	(148)	(44)	(352)	(77)	(148)	(168)	(44)	—
Total	$	28,403	33,330	38,751	16,775	43,735	58,768	42,870	30,178	41,177	51,317	44,996
		(10,470)	(19,282)	(19,281)	(7,936)	(21,899)	(33,966)	(31,124)	(27,588)	(41,177)	(32,757)	(19,243)

- no ARDA rating
- Alberta Transportation campsite located on lake provides access

Indian Domestic Fishing:

- licences sold between 1970-71 and 1980-81:

70-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81
10	6	--	1	--	2	--	*NR	3	*NR	--

Commercial Fishing Quotas:

- records available indicate fishing since 1942; see Table XXXIV for harvests and values between 1970-71 and 1980-81.
- between 1975-76 and 1980-81, the mean annual harvest from North Buck Lake constituted 2.6% of the mean annual harvest for Zone D.

Commercial Fishing Quotas:

- 9,050 kg whitefish

Estimated Annual Fish Production:

- 17,700 lb (8,036 kg) whitefish; 17,700 lb (8,036 kg) tullibee; 7,100 lb (3,223 kg) pike; 7,100 lb (3,223 kg) perch; 2,650 lb (1,203 kg) walleye. These theoretical estimates are considered to be conservative; (see commercial fisheries harvests, Table XXXIV a).

Fisheries Management Objectives:

- maintain existing levels of fish production for sport, domestic and commercial utilization

Data Gaps:

- spawning and other important habitat should be located
- fish population age structure should be determined
- physical features and water chemistry of lake should be determined
- sport fishing activity should be accurately evaluated

TABLE XXXIV a

COMMERCIAL FISHERIES HARVESTS FROM NORTH BUCK LAKE, 1970 - 1971 to 1980 - 1981

Species	Unit	70-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81
Whitefish	kg	14,633	13,210	11,657	7,264	6,356	10,215	7,468	10,218	10,603	10,701	14,934
	lb	32,298	29,098	25,677	16,000	14,000	22,500	16,450	22,507	23,355	23,570	32,895
Perch	kg							12	5			
	lb							25	12			
Pike	kg	159	182	999	159	136	182	45	22	91	379	236
	lb	350	400	2,201	350	300	400	100	48	200	835	520
Tullibee	kg	2,454	3,202	1,092	817	681	649	681	286	318	182	232
	lb	5,406	7,053	2,404	1,800	1,500	1,430	1,500	630	700	400	510
Ling	kg	404		852	397	363	318	454		1,090	953	1,081
	lb	890		1,877	875	800	700	1,000		2,400	2,100	2,380
Suckers	kg				1	227	136	91		23		
	lb				2	500	300	200		50		
Roe	kg									760	716	829
	lb									1,675	1,577	1,827
Total	kg	17,680	16,594	14,600	8,638	7,763	11,500	8,751	10,531	12,885	12,931	17,312
	lb	38,944	36,551	32,159	19,027	17,100	25,330	19,275	23,197	28,380	28,482	38,132

TABLE XXXIV b

DOLLAR VALUE OF COMMERCIAL FISHERIES HARVESTS FROM NORTH BUCK LAKE, 1970 - 1971 to 1980 - 1981

MARKET VALUE (VALUE TO FISHERMEN)

Species	70-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81
Whitefish	$ 16,149 (10,820)	13,967 (7,464)	13,266 (6,073)	10,080 (3,760)	7,930 (3,465)	12,545 (6,536)	11,468 (5,453)	14,625 (7,603)	14,383 (6,932)	20,000 (7,858)	27,960 (10,449)
Perch							$ 17 (2)	8 (4)			
Pike	$ 77 (30)	88 (25)	484 (115)	101 (20)	80 (13)	160 (30)	40 (13)	21 (8)	102 (20)	560 (103)	66 (66)
Tullibee	$ 1,730 (676)	2,186 (786)	756 (269)	689 (252)	660 (225)	675 (198)	701 (240)	275 (118)	330 (106)	195 (67)	36 (36)
Ling	$ 44 (18)		75 (75)	39 (39)	36 (36)	31 (31)	45 (45)		120 (120)	115 (115)	167 (167)
Suckers				— —	— —	— —	— —		— —	— —	
Roe									$ 4,187 (1,256)	12,616 (1,971)	14,616 (2,284)
Total	$ 18,000 (11,544)	16,241 (8,275)	14,581 (6,532)	10,909 (4,071)	8,706 (3,739)	13,411 (6,795)	12,271 (5,753)	14,929 (7,733)	19,122 (8,434)	33,486 (10,114)	42,845 (13,002)

OSBORNE CREEK connects Manatokan Lake (63-7-W4) and Barbara Lake (64-6-W4)

Fish Species Present:

- pike, (spawning only)

Sport Fishing:

- angler utilization unknown
- ARDA rating Class 3

Fisheries Management Objectives:

- none have been developed to date

Data Gaps:

- use of the stream as a spawning site by fish from Manatokan Lake should be investigated
- sport fishing activity should be accurately evaluated
- spawning and other important habitat should be located
- fish migrations or seasonal movements should be determined

PINEHURST LAKE (65-10-W4) 6,415 acres (2,596 ha)

Fish Species Present:

- whitefish, pike, walleye, tullibee, ling, suckers

Sport Fishing:

- lake is utilized by anglers; sportfishing intensity has not been quantified
- ARDA rating Class 1
- noted for its large pike (over 8 lbs)
- Alberta Transportation campsite located on lake provides access

Indian Domestic Fishing:

- 1 licence sold in 1970-71; 2 sold in 1972-73; 1 sold in 1980-81

Commercial Fishing:

- records available indicate fishing since 1942; see Table XXXV for harvests and values between 1970-71 and 1980-81

Commercial Fishing Quotas:

- 100,000 lb tullibee, or 20,000 lb whitefish, or 11,000 lb pike, or 1,100 lb walleye

Estimated Annual Fish Production:

- 32,100 lb (14,573 kg) whitefish; 32,100 lb (14,573 kg) tullibee; 12,800 lb (5,811 kg) pike; 4,800 lb (2,179 kg) walleye

Fisheries Management Objectives:

- maintain existing levels of fish production for sport, domestic and commercial utilization

Data Gaps:

- fish population age structure should be determined
- spawning areas should be located
- sport fishing activity should be accurately evaluated

PRIMROSE LAKE (67-1-W4) Area not estimated

Fish Species Present:

- whitefish, pike, walleye, tullibee, ling, suckers

Sport Fishing:

- lake is utilized by anglers; sportfishing intensity has not been quantified
- no ARDA rating
- lies within the Department of National Defence Primrose Lake Air Weapons Range; access is strictly controlled

TABLE XXXV a
COMMERCIAL FISHERIES HARVESTS FROM PINEHURST LAKE, 1970 - 1971 to 1980 - 1981

Species	Unit	70-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81
Whitefish	kg	1,972	5,909	13,483			100	272				
	lb	4,344	13,015	29,699			220	600				
Walleye	kg	1,901	1,183	310				363				
	lb	4,188	2,605	683				800				
Perch	kg	317		845								
	lb	697		1,860								
Pike	kg	8,318	2,537	30,786				68				
	lb	18,321	5,589	67,811				150				
Tullibee	kg	5,990	182	4,361				100				
	lb	13,193	400	9,606				220				
Ling	kg	1,619	789	1,496			12	68				
	lb	3,567	1,739	3,294			25	150				
Suckers	kg	3,747	8,787	686			4	91				
	lb	8,253	19,354	1,511			10	200				
Total	kg	23,864	19,387	51,967			116	962				
	lb	52,563	42,702	114,464			255	2,120				

TABLE XXXV b
DOLLAR VALUE OF COMMERCIAL FISHERIES HARVESTS FROM PINEHURST LAKE, 1970 - 1971 to 1980 - 1981
MARKET VALUE (VALUE TO FISHERMEN)

Species	70-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81
Whitefish	$ 1,687	2,504	4,752			95	30				
	(642)	(521)	(1,188)			(37)	(30)				
Walleye	$ 1,675	1,771	546				800				
	(1,425)	(1,042)	(177)				(520)				
Perch	$ 230		651								
	(55)		(89)								
Pike	$ 4,031	1,230	14,240				8				
	(1,858)	(559)	(3,125)				(8)				
Tullibee	$ 660	20	384				11				
	(528)	(16)	(384)				(11)				
Ling	$ 178	69	132			1	—				
	(143)	(69)	(132)			(1)	—				
Suckers	$ 242	—	—			—	—				
	(242)	—	—			—	—				
Total	$ 8,703	5,594	20,705			96	849				
	(4,893)	(2,207)	(5,095)			(38)	(569)				

Commercial Fishing:

- records available indicate fishing from 1942-48 and from 1958 to present; see Table XXVI for harvests and values between 1970-71 and 1980-81
- between 1975-76 and 1980-81, the mean annual harvest from Primrose Lake constituted 21.3% of the mean annual harvest from Zone C.

Commercial Fishing Quotas:

- there is no quota for the Alberta portion of this lake; by agreement with Saskatchewan, there is a "two lift" fishery, the harvest being whatever is caught in the nets in two lifts. The agreed quota for the entire lake is 500,000 lb whitefish for both provinces.

Estimated Annual Fish Production:

- 500,000 lb (227,000 kg) whitefish; no estimate for other species.

Fisheries Management Objectives:

- maintain existing levels of fish production for sport, domestic and commercial utilization by both provinces.

Data Gaps:

- fish population age structures should be determined
- spawning and other important habitat should be located
- walleye movements should be investigated
- sport fishing activity should be evaluated

PUNK CREEK

Source: Pinehurst Lake (65-10-W4)
Mouth: Beaver River (64-8-W4)

Fish Species Present:

- pike, perch, ling, suckers

Sport Fishing:

- angler utilization unknown
- ARDA rating Class 2

TABLE XXXVI a
COMMERCIAL FISHERIES HARVESTS FROM PRIMROSE LAKE, 1970 - 1971 to 1980 - 1981

Species	Unit	70-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81
Whitefish	kg	66,381	9,823	27,240	38,590	38,545	42,313	86,196	65,091	28,787	40,213	56,873
	lb	146,214	21,637	60,000	85,000	84,900	93,200	189,859	143,376	63,408	88,575	125,270
Walleye	kg	6,326	16,106	91	91	73	91	27	93	14	373	599
	lb	13,933	35,475	200	200	160	200	60	205	30	822	1,320
Pike	kg	925	318	129	318	272	454	246	181	182	59	58
	lb	2,038	700	285	700	600	1,000	541	400	400	130	128
Tullibee	kg	1,949	227	454	1,044	232	227	136			45	173
	lb	4,294	500	1,000	2,300	510	500	300			100	380
Ling	kg	454	454	908	1,816	817	681	545			18	885
	lb	1,000	1,000	2,000	4,000	1,800	1,500	1,200			40	1,950
Suckers	kg	1,816	454	227	1,589	36	91	91				67
	lb	4,000	1,000	500	3,500	80	200	200				148
Total	kg	77,851	27,382	29,049	43,448	39,975	43,857	87,241	65,368	28,983	40,708	58,655
	lb	171,479	60,312	63,985	95,700	88,050	96,600	192,160	143,981	63,838	89,667	129,196

TABLE XXXVI b
DOLLAR VALUE OF COMMERCIAL FISHERIES HARVESTS FROM PRIMROSE LAKE, 1970 - 1971 to 1980 - 1981: MARKET VALUE (VALUE TO FISHERMEN)

Species		70-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81
Whitefish	$	79,306	11,900	28,600	39,750	51,800	52,130	132,759	84,715	37,715	62,354	106,475
		(36,867)	(5,095)	(14,451)	(17,500)	(23,601)	(32,737)	(66,451)	(57,350)	(13,950)	(26,572)	(50,108)
Walleye	$	9,088	26,606	160	160	128	170	60	205	30	870	1,848
		(4,807)	(12,239)	(80)	(81)	(55)	(150)	(30)	(154)	(24)	(575)	(1,650)
Pike	$	448	154	63	196	160	400	237	144	197	104	80
		(173)	(49)	(30)	(110)	(57)	(150)	(162)	(60)	(52)	(39)	(38)
Tullibee	$	215	10	40	70	25	25	15			—	19
		(86)	(10)	(30)	(70)	(25)	(25)	(15)			—	(19)
Ling	$	40	20	80	140	90	75	60			—	—
		(20)	(20)	(60)	(140)	(90)	(75)	(60)			—	—
Suckers	$	—	20	—	—	—	—	—				7
		—	(20)	—	—	—	—	—				(7)
Total	$	89,097	38,710	28,943	40,316	52,203	52,800	133,131	85,064	37,942	63,328	108,429
		(41,953)	(17,433)	(14,651)	(17,901)	(23,828)	(33,137)	(66,718)	(57,564)	(14,026)	(27,186)	(51,822)

Fisheries Management Objectives:

- none have been developed to date

Data Gaps:

- spawning and other important habitat should be located
- sport fishing activity should be accurately evaluated
- fish migrations or seasonal movements should be determined

REDSPRING CREEK

Source: Redspring Lake (59-1-W4)
Mouth: leaves Alberta (61-1-W4)

Fish Species Present:

- pike

Sport Fishing:

- angler utilization unknown
- ARDA rating Class 2

Fisheries Management Objectives:

- none have been developed to date

Data Gaps:

- use of the creek as a spawning area should be investigated, and spawning and other important habitat should be located
- sport fishing activity should be accurately evaluated
- fish migrations or seasonal movements should be determined

REITA CREEK

Source: Angling Lake (60-3-W4)
Mouth: Beaver River (62-2-W4)

Fish Species Present:

- pike (spawning only), suckers

Sport Fishing:

- creek is utilized by anglers; sportfishing intensity has not been quantified
- ARDA rating Class 3

Fisheries Management Objectives:

- none have been developed to date

Data Gaps:

- spawning and other important habitat should be located
- sport fishing activity should be accurately evaluated
- fish migrations or seasonal movements should be determined

REITA LAKE

(59,60-3,4-W4)
2,553 acres (1,033 ha)

Fish Species Present:

- pike, suckers

Sport Fishing:

- angler utilization unknown
- ARDA rating Class 2

Commercial Fishing:

- records available indicate fishing since 1978; see Table XXXVII for harvests and values between 1978-79 and 1980-81
- between 1975-76 and 1980-81, the mean annual harvest from Reita Lake constituted 0.4% of the mean annual harvest from Zone C.

TABLE XXXVII a
COMMERCIAL FISHERIES HARVESTS FROM REITA LAKE, 1978-79 to 1980-81

Species	Unit	1978-80	1979-80	1980-81
Pike	kg	150	1,457	2,343
	lb	330	3,210	5,160
Suckers	kg	48	330	635
	lb	107	727	1,400
Total	kg	198	1,787	2,978
	lb	437	3,937	6,560

TABLE XXXVII b
DOLLAR VALUES OF COMMERCIAL FISHERIES HARVEST FROM REITA LAKE, 1978-79 to 1980-81: MARKET VALUE (VALUE TO FISHERMEN)

Species	1978-80	1979-80	1980-81
Pike	$148	1,748	3,040
	(148)	(1,012)	(2,130)
Suckers	$5	36	103
	(5)	(36)	(103)
Total	$153	1,784	3,143
	(153)	(1,048)	(2,233)

Commercial Fishing Quotas:

- 3,600 kg pike

Estimated Annual Fish Production:

- 5,100 lb (2,315 kg) pike

Fisheries Management Objectives:

- maintain existing levels of fish production for sport, domestic and commercial utilization

Data Gaps:

- fish population age structures should be determined
- spawning and other important habitat should be located
- physical features of the lake should be determined
- sport fishing activity should be accurately evaluated

RICH LAKE (64-11-W4) 1,793 acres (726 ha)

Fish Species Present:

- pike (summer only)

Sport Fishing:

- apparently no angler utilization of this lake
- ARDA rating Class 3

Indian Domestic Fishing:

- 2 licences sold in 1970-71, and 2 sold in 1971-72

Estimated Annual Fish Production:

- not estimated

Fisheries Management Objectives:

- none have been developed to date; shallow depth and low winter dissolved oxygen levels limit fish productivity

Data Gaps:

- spawning and other important habitat should be located
- physical features and water chemistry of lake should be determined
- winter dissolved oxygen levels should be monitored for 2 or 3 winters.

ST. LINA CREEK Source: (61-10-W4) Mouth: Beaver River (62-10-W4)

Fish Species Present:

- unknown; some fish from Beaver River may spawn in creek during spring

Sport Fishing:

- angler utilization unknown
- no ARDA rating

Fisheries Management Objectives:

- none have been developed to date

Data Gaps:

- sport fishing activity should be accurately evaluated
- spawning and other important habitat should be located
- fish migrations or seasonal movements should be determined

SAND RIVER Source: (71-2,3-W4) Mouth: Beaver River (62-7-W4)

Fish Species Present:

- unknown

Sport Fishing:

- angler utilization unknown
- much of the river lies in the Department of National Defence Primrose Lake Air Weapons Range and access is strictly controlled
- lower portion has been surveyed, and has an ARDA rating of Class 2

Commercial Bait Fishing:

- 1 licence sold in 1981

Fisheries Management Objectives:

- none have been developed to date

Data Gaps:

- fish populations should be surveyed
- spawning and other important habitat should be located
- sport fishing activity should be accurately evaluated
- fish migrations should be determined

SCHELTENS LAKE	(70-1-W4)	2,552 acres (1,033 ha)

Fish Species Present:

- pike, ling, suckers

Sport Fishing:

- apparently no angler utilization of this lake (restricted access)
- ARDA rating Class 3
- lies within the Department of National Defence Primrose Lake Air Weapons Range; access is strictly controlled

Estimated Annual Fish Production:

- 5,100 lb (2,315 kg) pike

Fisheries Management Objectives:

- maintain existing levels of fish production for sport and domestic utilization

Data Gaps:

- fish population age structures should be determined
- spawning and other important habitat should be located

SEIBERT LAKE (66-9-W4) 9,034 acres (3,656 ha)

Fish Species Present:

- whitefish, pike, walleye, tullibee, ling, suckers

Sport Fishing:

- lake is utilized by anglers; sportfishing intensity not recently quantified
- ARDA rating Class 1
- designated as a Trophy Pike Lake because of its large size pike (over 8 lbs). Lake must be fished under special licence.
- Alberta Forest Service campsite located on lake provides access

Commercial Fishing:

- records available indicate fishing from 1946 to 1950, and from 1955 to 1957

Estimated Annual Fish Production:

- 18,100 lb (8,217 kg) pike; 45,200 lb (20,521 kg) whitefish; 45,200 lb (20,521 kg) tullibee; 6,800 lb (3,087 kg) walleye

Fisheries Management Objectives:

- maintain reduced allowable catch of pike, regulation to promote the growth of large pike, and maintain existing levels of production of other species

Data Gaps:

- fish population age structures should be determined
- sport fishing activity should be accurately evaluated
- spawning and other important habitat should be located

SINCLAIR LAKE (6-5-W4) 449 acres (182 ha)

Fish Species Present:

- pike

Sport Fishing:

- angler utilization unknown
- ARDA rating Class 4

Estimated Annual Fish Production:

- 900 lb (410 kg) pike

Fisheries Management Objectives:

- maintain existing levels of fish production for sport and domestic utilization

Data Gaps:

- physical features of lake should be determined
- fish population age structures should be determined
- spawning and other important habitat should be located

SKELETON LAKE (65-18, 19-W4) 4,480 acres (1,813 ha)

Fish Species Present:

- whitefish, pike, perch, walleye, tullibee, ling

Sport Fishing:

- lake is utilized by anglers; sportfishing intensity has not been quantified
- no ARDA rating

Indian Domestic Fishing:

- licences sold between 1970-71 and 1980-81

70-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81
35	28	8	13	--	4	2	*NR	18	*NR	4

Commercial Bait Fishing:

- 1 licence sold in 1981

Commercial Fishing:

- records available indicate irregular fishing since 1944; see Table XXXVIII for harvests and values between 1970-71 and 1980-81

TABLE XXXVIII a
COMMERCIAL FISHERIES HARVESTS FROM SKELETON LAKE, 1970 - 1971 to 1980 - 1981

Speices	Unit	70-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81
Whitefish	kg	6,231		182		3,405		10,715	14,074	13,474	4,634	12,728
	lb	13,725		400		7,500		23,602	31,000	29,679	10,206	28,036
Walleye	kg	57						30	45	5	63	70
	lb	125						67	100	12	138	154
Perch	kg	7								7		
	lb	15								14		
Pike	kg	831		5		227		245	68	466	440	198
	lb	1,830		12		500		540	150	1,027	970	436
Tullibee	kg	113		3		227		182		26	23	197
	lb	250		7		500		400		56	51	434
Ling	kg	2,794		91		91		14	182	186		
	lb	6,155		200		200		30	400	409		
Suckers	kg								45	45		
	lb								100	100		
Roe	kg											316
	lb											696
Total	kg	10,033		281		3,950		11,186	14,414	14,209	5,160	13,509
	lb	22,100		619		8,700		24,639	31,750	31,297	11,365	29,756

TABLE XXXVIII b
DOLLAR VALUE OF COMMERCIAL FISHERIES HARVESTS FROM SKELETON LAKE, 1970 - 1971 to 1980 - 1981:
MARKET VALUE (VLAUE TO FISHERMEN)

Species	70-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81
Whitefish	$ 3,431		180		3,825		13,642	16,500	14,582	5,206	14,302
	(1,632)		(60)		(2,250)		(5,322)	(5,985)	(4,876)	(3,445)	(5,539)
Walleye	$ 85						67	100	—	193	117
	(43)						(40)	(70)	—	(142)	(117)
Perch	$ 4								—		
	(2)								—		
Pike	$ 403		3		150		162	78	171	656	240
	(137)		(1)		(150)		(162)	(30)	(150)	(323)	(93)
Tullibee	$ 10		—		20		—		—	3	30
	(9)		—		(20)		—		—	(3)	(30)
Ling	$ 246		9		—		—	20	20		
	(186)		(9)		—		—	(20)	(20)		
Suckers	$							—	—		
								—	—		
Roe											$ 5,568
											(870)
Total	$ 4,179		192		3,995		13,871	16,698	14,773	6,058	20,257
	(2,009)		(70)		(2,420)		(5,524)	(6,105)	(5,046)	(3,913)	(6,649)

- between 1975-76 and 1980-81, the mean annual harvest from Skeleton Lake constituted 2.4% of the mean annual harvest for Zone D.

Commercial Fishing Quotas:

- 9,050 kg whitefish, or 900 kg pike and walleye (combined)

Estimated Annual Fish Production:

- 22,400 lb (10,170 kg) whitefish; 22,400 lb (10, 170 kg) tullibee; 9,000 lb (4,086 kg) pike; 9,000 lb (4,086 perch; 3,400 lb (1,544 kg) walleye

Fisheries Management Objectives:

- maintain existing levels of fish production for sport, domestic and commercial utilization

Data Gaps:

- physical features and water chemistry of lake should be determined
- spawning and other important habitat should be located
- sport fishing activity should be accurately evaluated

SOARS LAKE (59-1-W4) 365 acres (148 ha)

Fish Species Present:

- pike

Sport Fishing:

- lake is utilized by anglers; sportfishing intensity has not been quantified
- ARDA rating Class 2
- lies almost totally within Metis Colony, so is available for fishing only to members of Colony

Estimated Annual Fish Production:

- 750 lb (340 kg) pike

Fisheries Management Objectives:

- maintain existing levels of fish production for sport and domestic utilization

Data Gaps:

- physical features and water chemistry of lake should be determined
- fish population age structures should be determined
- spawning and other important habitat should be located
- sport fishing activity should be accurately evaluated

SPENCER LAKE (67-9-W4) 4,480 acres (1,813 ha)

Fish Species Present:

- whitefish, pike, walleye

Sport Fishing:

- lake is utilized by anglers; sportfishing intensity has not been quantified
- no ARDA rating
- much of the lake lies within the Department of National Defence Primrose Lake Air Weapons Range; access is strictly controlled

Commercial Fishing:

- records available indicate fishing since 1942; see Table XXXIX for harvest and values between 1970-71 and 1980-81
- between 1975-76 and 1980-81, the mean annual harvest from Spencer Lake constituted 11.4% of the mean annual harvest from Zone C.

Commercial Fishing Quotas:

- 31,700 kg whitefish

Estimated Annual Fish Production:

- 22,400 lb (10,170 kg) whitefish; 9,000 lb (4,086 kg) pike; 3,400 lb (1,544 kg) walleye. Actual production is higher than these theoretical estimates (see commercial fisheries harvests, Table XXXIX a)

TABLE XXXIX a
COMMERCIAL FISHERIES HARVESTS FROM SPENCER LAKE, 1970 - 1971 to 1980 - 1981

Species	Unit	70-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81
Whitefish	kg	38,472	36,110	30,684	25,953	44,196	24,226	35,972	31,008	26,968	28,644	21,359
	lb	84,741	79,538	67,585	57,165	97,348	53,360	79,232	68,300	59.400	63.092	47,047
Walleye	kg	21	43	68	56	44	154	295	405	555	301	148
	lb	46	94	150	124	97	340	650	893	1,223	664	327
Pike	kg	23	67	93	132	309	318	100	469	1,623	1,014	894
	lb	50	148	206	291	681	700	220	1,034	3,575	2,234	1,968
Ling	kg		23	9	254	43	182	38	62	125	91	91
	lb		50	20	559	95	400	84	136	276	200	200
Suckers	kg	23	23			43	272	204	72	140		
	lb	50	50			95	600	450	158	308		
Total	kg	38,539	36,266	30,854	26,395	44,635	25,152	36,609	32,016	29,411	30,050	22,492
	lb	84,887	79,880	67,961	58,139	98,316	55,400	80,636	70,521	64,782	66,190	49,542

TABLE XXXIX b
DOLLAR VALUE OF COMMERCIAL FISHERIES HARVESTS FROM SPENCER LAKE, 1970 - 1971 to 1980 - 1981: MARKET VALUE (VALUE TO FISHERMEN)

Species		70-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81
Whitefish	$	52,539 (34,320)	55,677 (29,883)	53,679 (25,688)	40,932 (22,802)	68,557 (36,992)	39,406 (32,016)	67,808 (37,239)	49,176 (40,980)	51,777 (35,640)	53,627 (41,104)	60,000 (30,581)
Walleye	$	31 (15)	75 (37)	141 (68)	112 (63)	63 (63)	340 (238)	747 (455)	982 (714)	1,529 (1,529)	996 (996)	965 (654)
Pike	$	11 (5)	33 (11)	66 (21)	104 (73)	272 (272)	280 (210)	92 (66)	362 (310)	2,860 (1,251)	1,600 (1,091)	1,214 (526)
Ling			$ 1 (1)	1 (1)	28 (28)	5 (5)	20 (20)	4 (4)	7 (7)	14 (14)	10 (10)	10 (10)
Suckers	$	1 —	— —			3 (3)	30 (30)	23 (23)	9 (9)	15 (15)		
Total	$	52,582 (34,340)	55,786 (29,932)	53,887 (25,778)	41,176 (22,966)	68,900 (37,335)	40,076 (32,514)	68,674 (37,787)	50,536 (42,020)	56,195 (38,449)	56,233 (43,201)	62,189 (31,771)

Fisheries Management Objectives:

- maintain existing levels of fish production for sport, domestic and commercial utilization

Data Gaps:

- physical features of lake should be determined
- fish population age structures should be determined
- spawning and other important habitat should be located

TAWAKWATO LAKE (66-15-W4) 691 acres (280 ha)

Fish Species Present:

- pike

Sport Fishing:

- lake is utilized by anglers; sportfishing intensity has not been quantified
- no ARDA rating

Commercial Fishing:

- records available indicate fishing from 1963 to 1973 only; see Table XL for harvests and values from 1970-71 to 1972-73.

TABLE XL a
COMMERCIAL FISHERIES HARVEST FROM
TAWAKWATO LAKE, 1970-71 to 1972-73

Species	Unit	1970-71	1971-72	1972-73
Pike	kg	250	6,526	1,498
	lb	550	14,375	3,300

TABLE XL b
DOLLAR VALUE OF COMMERCIAL FISHERIES HARVEST FROM TAWAKWATO LAKE
1970 - 1971 to 1972 - 1973:
MARKET VALUE (VALUE TO FISHERMEN)

Species	1970-71	1971-72	1972-73
Pike	$121 (47)	3,162 (647)	726 (132)

Estimated Annual Fish Production:

- 1,400 lb (636 kg) pike

Fisheries Management Objectives:

- maintain existing levels of fish production for sport, domestic and commercial utilization

Data Gaps:

- physical features and water chemistry of lake should be determined
- fish population age structures should be determined
- sport fishing activity should be accurately evaluated
- spawning and other important habitat should be located

THINLAKE RIVER	Source: Bangs Lake (60-8-W4)	Mouth: Moose Lake (60-7-W4)

Fish Species Present:

- pike, walleye (spawning only), suckers

Sport Fishing:

- anglers apparently utilize the mouth of the river; sportfishing intensity has not been quantified
- ARDA rating Class 4

Fisheries Management Objectives:

- none have been developed to date

Data Gaps:

- spawning and other important habitat should be located
- sport fishing activity should be accurately evaluated
- fish migrations or seasonal movements should be determined

THOMPSON LAKE (60-2-W4) 480 acres (194 ha)

Fish Species Present:

- pike

Sport Fishing:

- angler utilization unknown
- ARDA rating Class 2

Commercial Fishing:

- records available indicate fishing since 1978; see Table XLI for harvests and values from 1978-79 to 1980-81.
- between 1975-76 and 1980-81, the mean annual harvest from Thompson Lake constituted 0.3% of the mean annual harvest from Zone C.

TABLE XLI a
COMMERCIAL FISHERIES HARVESTS FROM
THOMPSON LAKE, 1978-79 to 1980-81

Species	Unit	1978-79	1979-80	1980-81
Pike	kg	91	1,907	2,151
	lb	200	4,200	4,738

TABLE XLI b
DOLLAR VALUE OF COMMERCIAL FISHERIES HARVESTS FROM THOMPSON LAKE 1978-1979 to 1980-1981: MARKET VALUE (VALUE TO FISHERMEN)

Species	1978-79	1979-80	1980-81
Pike	$60 (60)	2,352 (1,029)	2,776 (995)

Commercial Fishing Quotas:

- 1,800 kg pike

Estimated Annual Fish Production:

- 1,000 lb (454 kg) pike. Actual production is higher than this theoretical estimate (see Table XLI a for commercial fisheries harvests)

Fisheries Management Objectives:

- maintain existing levels of fish production for sport, domestic and commercial utilization.

Data Gaps:

- physical features of lake should be determined
- fish population age structures should be determined
- spawning and other important habitat should be located
- sport fishing activity should be accurately evaluated

TOMPKINS LAKE (62-12-W4) 400 acres (162 ha)

Fish Species Present:

- none

Sport Fishing:

- apparently no angler utilization of this lake
- ARDA rating Class 4

Fisheries Management Objectives:

- none have been developed to date

Data Gaps:

- physical features and water chemistry of lake should be determined to see if the lake is capable of supporting fish

TOUCHWOOD LAKE (67-10-W4) 7,267 acres (2,941 ha)

Fish Species Present:

- whitefish, pike, walleye, tullibee, ling, suckers

Sport Fishing:

- lake is utilized by anglers; sportfishing intensity has not been quantified
- ARDA rating Class 1
- noted for its large pike (over 8 lbs)
- Alberta Forest Service campsite located on lake provides access

Indian Domestic Fishing:

- 1 licence sold in 1980-81

Commercial Bait Fishing:

- 1 licence sold in 1981.

Commercial Fishing:

- records available indicate fishing since 1942; see Table XLII for harvests and values between 1970-71 and 1980-81.
- between 1975-76 and 1980-81, the mean annual harvest from Touchwood Lake constituted 0.4% of the mean annual harvest for Zone D.

TABLE XLII a

COMMERCIAL FISHERIES HARVESTS FROM TOUCHWOOD LAKE, 1970 - 1971 to 1980 - 1981

Species	Unit	70-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81
Whitefish	kg	11,449	8,308	8,942	4,820	3,587	953	500	499	48	1,864	1,807
	lb	25,218	18,300	19,696	10,615	7,900	2,100	1,100	1,100	105	4,106	3,980
Walleye	kg	66	359	300	23	45		23	141	31	713	312
	lb	145	790	660	50	100		50	310	69	1,570	688
Perch	kg			11								
	lb			24								
Pike	kg	189	218	327	136	45	23	11	64	10	2,440	126
	lb	416	480	720	300	100	50	25	140	21	5,375	278
Tullibee	kg			45	11							10
	lb			100	25							23
Ling	kg	4,926	1,273	862	68	45	227	68	45	45	704	228
	lb	10,850	2,805	1,900	150	100	500	150	100	100	1,550	501
Suckers	kg	18	23	45	11	23		45	45		213	61
	lb	40	50	99	25	50		100	100		470	135
Roe	kg										97	
	lb										213	
Total	kg	16,648	10,181	10,532	5,069	3,745	1,203	647	794	134	6,031	2,544
	lb	36,669	22,425	23,199	11,165	8,250	2,650	1,425	1,750	295	13,284	5,605

TABLE XLII b

DOLLAR VALUE OF COMMERCIAL FISHERIES HARVESTS FROM TOUCHWOOD LAKE, 1970 - 1971 to 1980 - 1981: MARKET VALUE (VALUE TO FISHERMEN)

Species		70-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81
Whitefish	$	6,304	9,882	9,458	4,102	4,823	1,080	564	588	16	2,450	2,028
		(3,404)	(3,069)	(3,553)	(2,485)	(1,666)	(436)	(308)	(293)	(16)	(960)	(925)
Walleye	$	94	592	528	40	80		50	310	69	2,198	963
		(67)	(342)	(148)	(22)	(35)		(30)	(228)	(50)	(1,368)	(688)
Perch				$ 8								
				(2)								
Pike	$	91	106	158	91	27	18	2	67	2	3,200	160
		(42)	(60)	(38)	(30)	(13)	(2)	(2)	(13)	(2)	(996)	(58)
Tullibee	$			5	1							2
				(4)	(1)							(2)
Ling	$	457	112	76	7	4	20	8	5	5	85	38
		(380)	(112)	(76)	(7)	(4)	(20)	(8)	(5)	(5)	(85)	(38)
Suckers	$	1	—	—	—	—		—	—		—	—
		(1)	—	—	—	—		—	—		—	—
Roe											$ 1,704	
											(266)	
Total	$	6,947	10,692	10,233	4,241	4,934	1,118	624	970	92	9,637	3,191
		(3,894)	(3,583)	(3,821)	(2,545)	(1,718)	(458)	(348)	(539)	(73)	(3,675)	(1,711)

Commercial Fishing Quotas:

- 20,000 lb whitefish, or 1,500 lb walleye, or 2,500 lb pike

Estimated Annual Fish Production:

- 36,300 lb (16,480 kg) tullibee; 36,300 lb (16,480 kg) whitefish; 14,500 (6,583 kg) pike; 5,450 lb (2,474 kg) walleye.
- Because of its depth, lake has naturally low level of productivity and these theoretical estimates are believed to be high for whitefish, pike and walleye, and low for tullibee (see commercial fisheries harvests, Table XLII a).

Fisheries Management Objectives:

- maintain existing levels of fish production for sport, domestic and commercial utilization.

Data Gaps:

- fish population age structures should be determined
- spawning and other important habitat should be located
- sport fishing activity should be accurately evaluated

TUCKER LAKE (64-4-W4) 1,536 acres (622 ha)

Fish Species Present:

- pike, perch, suckers

Sport Fishing:

- lake is utilized by anglers; sportfishing intensity has not been quantified
- ARDA rating Class 2
- noted for its large perch (over 1 lb)

Commercial Bait Fishing

- 1 licence sold in 1981

Commercial Fishing:

- records available indicate the lake was fished once in 1944-45, and from 1950 to present; see Table XLIII for harvests and values between 1970-71 and 1980-81.
- between 1975-76 and 1980-81, the mean annual harvest from Tucker Lake constituted 3.0% of the mean annual harvest from Zone C.

Commercial Fishing Quotas:

- 11,350 kg pike, or 1,150 kg perch

Estimated Annual Fish Production:

- 3,100 lb (1,407 kg) pike; 3,100 lb (1,407 kg) perch. Actual pike production exceeds this theoretical estimate (see commercial fisheries harvests, Table XLIII a).

Fisheries Management Objectives:

- maintain existing levels of fish production for sport, domestic and commercial utilization

Data Gaps:

- water chemistry of lake should be determined
- spawning and other important habitat should be located
- fish population age structures should be determined
- sport fishing activity should be accurately evaluated

WAYETENAU LAKE (61-13-W4) 338 acres (137 ha)

Fish Species Present:

- pike, perch

Sport Fishing:

- lake is utilized by anglers; sportfishing intensity has not been quantified
- ARDA rating Class 2

TABLE XLIII a
COMMERCIAL FISHERIES HARVESTS FROM TUCKER LAKE, 1970 - 1971 to 1980 - 1981

Species	Unit	70-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81
Whitefish	kg		34	82	6	20	5	10				5
	lb		75	180	12	45	10	22				10
Walleye	kg		2	1								
	lb		4	3								
Perch	kg	2,497	1,289	518	499	1,830	1,129	157	311	28	660	690
	lb	5,499	2,840	1,140	1,100	4,031	2,487	345	685	62	1,455	1,520
Pike	kg	11,360	8,896	11,985	10,401	9,237	2,009	3,500	8,121	6,566	8,128	9,159
	lb	25,023	19,594	26,399	22,910	20,346	4,425	7,710	17,888	14,464	17,903	20,174
Ling	kg						24	11	14	22	4	50
	lb						54	25	32	48	9	111
Suckers	kg			726		159	187	91	88	12	663	749
	lb			1,600		350	412	200	193	26	1,460	1,650
Total	kg	13,857	10,221	13,312	10,905	11,246	3,354	3,769	8,534	6,628	9,455	10,653
	lb	30,522	22,513	29,322	24,022	24,772	7,388	8,302	18,798	14,600	20,827	23,465

TABLE XLIII b
DOLLAR VALUE OF COMMERCIAL FISHERIES HARVESTS FROM TUCKER LAKE, 1970 - 1971 to 1980 - 1981: MARKET VALUE (VALUE TO FISHERMEN)

Species	70-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81
Whitefish		$ —	96	5	36	7	13				6
		—	(30)	(2)	(36)	(7)	(13)				(6)
Walleye		$ 1	2								
		(1)	(1)								
Perch	$ 1,924	852	399	418	1,814	1,243	224	445	51	1,310	1,520
	(220)	(249)	(266)	(138)	(1,612)	(995)	(173)	(342)	(41)	(493)	(1,520)
Pike	$ 5,505	4,311	6,807	6,960	6,104	1,328	3,957	7,865	8,516	10,456	12,099
	(2,002)	(1,182)	(2,743)	(1,421)	(6,104)	(1,328)	(2,313)	(5,366)	(3,817)	(1,909)	(5,044)
Ling						$ —	1	2	2	—	—
						(2)	(1)	(2)	(2)	—	—
Suckers			$ —		10	—	11	11	1	—	83
			—		(10)	(12)	(11)	(11)	(1)	--	(83)
Total	$ 7,429	5,164	7,304	7,383	7,964	2,578	4,206	8,323	8,570	11,766	13,708
	(2,222)	(1,432)	(3,040)	(1,561)	(7,762)	(2,344)	(2,511)	(5,721)	(3,861)	(2,402)	(6,653)

Indian Domestic Fishing:

- licences sold between 1970-71 and 1980-81

70-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81
9	10	3	18	12	6	--	*NR	2	*NR	1

Commercial Fishing:

- records available indicate fishing in 1945-46, 1952-53 and 1960-63 only

Estimated Annual Fish Production:

- 700 lb (318 kg) pike; 700 lb (318 kg) perch

Fisheries Management Objectives:

- maintain existing levels of fish production for sport, domestic and commercial utilization

Data Gaps:

- physical features of lake should be determined
- fish population age structures should be determined
- sport fishing activity should be accurately evaluated
- spawning and other important habitat should be located

WHITEFISH LAKE (62-13-W4) 7,365 acres (2,980 ha)

Fish Species Present:

- whitefish, pike, perch, walleye, tullibee, ling, suckers

Sport Fishing:

- lake is utilized by anglers; sportfishing intensity has not been quantified
- ARDA rating Class 1

Indian Domestic Fishing:

- licences sold between 1970-71 and 1980-81:

70-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81
88	63	61	58	73	54	54	*NR	57	*NR	33

Commercial Fishing:

- records available indicate fishing since 1942; see Table XLIV for harvests and values between 1970-71 and 1980-81.
- between 1975-76 and 1980-81, the mean annual harvest from Whitefish Lake constituted 5.8% of the mean annual harvest from Zone D.

Commercial Fishing Quotas:

- 45,350 kg tullibee/20,250 kg whitefish, or 2,925 kg walleye, or 2,925 kg pike

Estimated Annual Fish Production:

- 36,800 lb (16,707 kg) tullibee; 36,800 lb (16,707 kg) whitefish; 14,700 lb (6,674 kg) pike; 14,700 lb (6,674 kg) perch; 5,500 lb (2,497 kg) walleye

Fisheries Management Objectives:

- maintain existing levels of fish production for sport, domestic and commercial utilization

Data Gaps:

- fish population age structures should be determined
- spawning and other important habitat should be located
- sport fishing activity should be accurately evaluated

WOLF LAKE (66-7-W4) 7,040 acres (2,849 ha)

Fish Species Present:

- whitefish, pike, perch, walleye, tullibee, ling, suckers

TABLE XLIV a
COMMERCIAL FISHERIES HARVESTS FROM WHITEFISH LAKE, 1970 - 1971 to 1980 - 1981

Species	Unit	70-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81
Whitefish	kg	16,639	3,454	12,155	18,208	9,600	10,462	16,793	10,558	8,809	3,104	21,317
	lb	36,649	7,607	26,774	40,105	21,145	23,045	36,988	23,257	19,402	6,837	46,954
Walleye	kg	3,289	2,652	509	228	184	160		121	599	910	352
	lb	7,245	5,842	1,120	503	405	353		266	1,320	2,004	775
Perch	kg	73					73				3	
	lb	160					160				6	
Pike	kg	20,218	5,620	4,340	4,107	2,433	3,807		806	2,113	3,399	2,047
	lb	44,534	12,379	9,560	9,046	5,360	8,385		1,775	4,655	7,487	4,510
Tullibee	kg	60,867	30,200	17,378	23,253	8,422	3,482		1,135	16,126	12,050	37,854
	lb	134,068	66,521	38,277	51,218	18,550	7,670		2,500	35,520	26,541	83,378
Ling	kg	2,308	3,554	647	269	375	1,110			150	133	231
	lb	5,083	7,828	1,425	592	825	2,445			330	294	510
Suckers	kg	2,634	1,510	529	685	272	341			45	254	384
	lb	5,802	3,325	1,165	1,510	600	750			100	560	845
Total	kg	106,028	46,990	35,558	46,750	21,286	19,435	16,793	12,620	27,842	19,853	62,185
	lb	233,541	103,502	78,321	102,974	46,885	42,808	36,988	27,798	61,327	43,729	136,972

TABLE XLIV b
DOLLAR VALUE OF COMMERCIAL FISHERIES HARVESTS FROM WHITEFISH LAKE, 1970 - 1971 to 1980 - 1981: MARKET VALUE (VALUE TO FISHERMEN)

Species	70-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81
Whitefish	$ 13,560	3,043	9,482	11,116	10,615	11,495	25,290	15,470	9,981	6,080	33,257
	(7,438)	(1,521)	(4,665)	(4,649)	(3,897)	(5,856)	(10,698)	(7,099)	(4,627)	(1,914)	(14,665)
Walleye	$ 4,927	4,381	829	402	324	290		266	1,005	2,809	1,042
	(3,246)	(2,043)	(510)	(252)	(163)	(145)		(176)	(601)	(1,158)	(506)
Perch	$ 48					88				2	
	(14)					(25)				(2)	
Pike	$ 8,907	2,723	2,103	2,472	1,649	515		637	2,372	1,851	2,770
	(4,088)	(928)	(502)	(453)	(482)	(110)		(190)	(855)	(1,744)	(854)
Tullibee	$ 6,703	3,326	1,531	2,507	863	377		125	1,351	335	5,970
	(5,363)	(2,993)	(1,531)	(2,507)	(863)	(377)		(125)	(1,351)	(335)	(5,970)
Ling	$ 203	352	57	29	37	120			12	16	37
	(203)	(352)	(57)	(29)	(37)	(120)			(12)	(16)	(37)
Suckers	$ 174	150	—	75	—	25			4	31	61
	(174)	(150)	—	(75)	—	(25)			(4)	(31)	(61)
Total	$ 34,522	13,975	14,002	16,601	13,488	12,910	25,290	16,498	14,725	11,124	43,137
	(20,526)	(7,987)	(7,265)	(7,965)	(5,442)	(6,658)	(10,698)	(7,590)	(7,450)	(5,200)	(22,093)

Sport Fishing:

- lake is utilized by anglers
- ARDA rating Class 1
- Alberta Forest Service campsite located on lake provides access
- angler activity during 1979 and 1980:

	No. Anglers Surveyed	Angler Hours	Avg. Hours/ Anglers	Harvest by Anglers Surveyed
1979	1,726	12,502	7.2	1,606 kg walleye; 4,037 kg pike
1980	3,376	15,662	4.6	1,330 kg walleye; 6,858 kg pike

Indian Domestic Fishing:

- 1 licence sold in 1970-71; 1 sold in 1976-77; 4 sold in 1980-81

Commercial Bait Fishing:

- 1 licence sold in 1981

Commercial Fishing:

- records available indicate fishing since 1942; see Table XLV for harvests and values between 1970-71 and 1980-81
- between 1975-76 and 1980-81, the mean annual harvest from Wolf Lake constituted 8.8% of the mean annual harvest from Zone C.

Commercial Fishing Quotas:

- 9,050 kg whitefish, or 3,650 kg pike, or 1,350 kg walleye

Estimated Annual Fish Production:

- 35,200 lb (15,981 kg) whitefish; 35,200 lb (15,981 kg) tullibee; 5,300 lb (2,406 kg) walleye; 14,100 lb (6,401 kg) pike. Actual whitefish production is probably slightly less than theoretical estimates.

Fisheries Management Objectives:

- maintain existing levels of fish production for sport, domestic and commercial utilization.

TABLE XLV a
COMMERCIAL FISHERIES HARVESTS FROM WOLF LAKE, 1970 - 1971 to 1980 - 1981

Species	Unit	70-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81
Whitefish	kg	1,370	1,491	3,189	4,757	4,356	9,124	7,634	7,669	8,656	9,255	5,245
	lb	3,017	3,284	7,024	10,477	9,595	20,097	16,815	16,892	19,066	20,385	11,553
Walleye	kg	2,142	1,462	585	911	1,308	1,087	1,235	1,005	1,216	818	731
	lb	4,718	3,220	1,289	2,007	2,881	2,393	2,719	2,214	2,679	1,803	1,611
Perch	kg	45										
	lb	100										
Pike	kg	20,397	5,399	6,569	3,398	2,732	2,922	4,908	6,619	5,422	3,878	4,740
	lb	44,928	11,893	14,468	7,484	6,018	6,436	10,811	14,579	11,943	8,541	10,440
Tullibee	kg	704		50	26	30	258	741	263	258	908	227
	lb	1,550		110	58	65	569	1,631	578	568	2,000	500
Ling	kg	903	1,546	1,857	1,961	1,643	2,789	1,438	671	1,174	1,416	477
	lb	1,990	3,405	4,091	4,320	3,620	6,144	3,168	1,478	2,585	3,120	1,050
Suckers	kg	2,698	3,161	2,534	1,223	602	7,832	7,901	7,320	11,073	4,731	7,772
	lb	5,942	6,962	5,582	2,694	1,325	17,252	17,404	16,124	24,391	10,420	17,120
Total	kg	28,259	13,059	14,784	12,276	10,671	24,012	23,857	23,547	27,799	21,006	19,192
	lb	62,245	28,764	32,564	27,040	23,504	52,891	52,548	51,865	61,232	46,269	42,274

TABLE XLV b
DOLLAR VALUE OF COMMERCIAL FISHERIES HARVESTS FROM WOLF LAKE, 1970 - 1971 to 1980 - 1981: MARKET VALUE (VALUE TO FISHERMEN)

Species		70-71	71-72	72-73	73-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81
Whitefish	$	1,508	1,149	4,668	5,759	4,977	11,968	12,180	11,250	11,440	16,308	10,304
		(1,508)	(1,149)	(3,161)	(4,715)	(3,838)	(10,144)	(9,248)	(10,980)	(11,440)	(16,308)	(9,242)
Walleye	$	3,208	2,395	1,031	1,871	2,305	1,675	2,990	2,214	3,081	2,704	3,222
		(1,887)	(1,288)	(773)	(1,871)	(1,873)	(1,675)	(2,583)	(2,103)	(3,081)	(2,704)	(3,222)
Perch	$	30										
		(10)										
Pike	$	9,984	2,616	5,064	4,490	1,800	1,609	5,121	5,248	4,777	4,870	6,264
		(5,391)	(1,903)	(5,064)	(4,490)	(1,504)	(1,609)	(3,784)	(4,374)	(4,777)	(4,270)	(6,264)
Tullibee	$	77		4	3	3	28	106	29	28	130	35
		(36)		(4)	(3)	(3)	(28)	(106)	(29)	(28)	(130)	(35)
Ling	$	80	136	205	216	181	307	206	74	129	203	42
		(60)	(136)	(205)	(216)	(181)	(307)	(206)	(74)	(129)	(203)	(42)
Suckers	$	178	139	279	135	66	1,208	696	967	976	521	514
		(178)	(139)	(279)	(135)	(66)	(1,208)	(696)	(967)	(976)	(521)	(514)
Total	$	15,065	6,435	11,251	12,474	9,332	16,795	21,299	19,782	20,431	24,736	20,381
		(9,070)	(4,615)	(9,486)	(11,430)	(7,465)	(14,971)	(16,623)	(18,527)	(20,431)	(24,136)	(19,319)

Data Gaps:

- sport fishing activity should continue to be accurately evaluated
- spawning and other important habitat should be located

WOLF RIVER
Source: Loseman Lake (68-3-W4)
Mouth: Sand River (66-8-W4)

Fish Species Present:

- unknown

Sport Fishing:

- angler utilization unknown
- no ARDA rating
- much of the river lies within the Department of National Defence Air Weapons Range and access is strictly controlled

Fisheries Management Objectives:

- none have been developed to date

Data Gaps:

- fish populations should be surveyed
- spawning and other important habitat should be located
- sport fishing activity should be accurately evaluated
- fish migrations or seasonal movements should be determined

VI. CONCLUSIONS

The fish populations of the shallow, and biologically productive lakes in the Cold Lake-Beaver River Basin support substantial sport, domestic and commercial use. Located in the Alberta's "Lakeland" tourist zone, the Basin is a popular area for recreational boating and sportfishing. Sportfishing is particularly intense on those lakes with parks, cottages, or other recreational developments along the shoreline.

Many lakes have walleye, or large perch or pike, all of which are favored sportfish. Two (Seibert and May Lakes) of a total of 7 provincial Trophy Lakes are also located in the Basin. Cold Lake offers a unique sportfishing opportunity for lake trout, and rainbow trout are stocked in Chatwin and Hasse Lakes. In 1980, sportfishing activity in the Energy and Natural Resources Northeast Administrative Region, which includes the Basin, exceeded 1,500,000 man-days, representing almost 34% of all sportfishing activity in the province.

Because harvest figures for the Indian Domestic fishery are not available, licence sales have been used to indicate the level of fishing activity in the Basin. Indian Domestic licences sold in the Basin constituted an annual average of 44.1% of all Indian Domestic fishing licences sold in the province between 1970-71 and 1980-81.

Commercial fishing provides economic benefits for many residents of the Cold Lake - Beaver River Basin. Mean annual harvests between 1970-71 and 1980-81 from 33 commercially fished lakes in the Basin exceeded 375,000 kg

(826,500 lb), representing an annual average of 16.8% of the provincial harvest.

In order to accomodate increasing demands by sport, domestic and commercial fishing, it will be necessary to maintain existing fishing opportunities, and levels of fish production. To this end, water quality should be maintained at standards identified in this report, and water levels should be maintained at levels protective of fish habitat, particularly spawning habitat. At present, inadequate information limits the development and implementation of more detailed management objectives and strategies. More information is particularly required in the following areas:

- sizes of standing crops of fish should be accurately determined
- spawning areas, migrations and seasonal movements, and age structures of fish populations all require further investigation
- some preliminary water chemistry and physical data have been collected, but more extensive surveys are required for many lakes
- key aquatic habitat should be identified, particularly if it is likely to be affected by water abstractions and/or water level fluctuations
- sport and Indian Domestic catches should be quantified
- accurate levels of species production in each lake should be established
- existing habitat conditions should be accurately described, and any changes in the environmental conditions resulting from recreational, industrial, or agricultural activities which negatively affect fish or fish production should be investigated

- limiting effects of eutrophication on fish production should be evaluated and other limiting factors should be identified

With this information, existing fish populations and habitat could be described accurately, and some meaningful estimate could be made as to the type and degree of impact that water manipulation would likely have on the fish and fisheries of individual waters in the Cold Lake - Beaver River Basin.

VII. RECOMMENDATIONS

1. Because of the heavy demand on the fish populations of the Cold Lake-Beaver River Basin by sport, domestic and commercial fishermen, it is recommended that the preservation and enhancement of the fisheries be considered a priority use of water in the Basin.
2. In order to sustain fisheries harvests by sport, domestic and commercial fishermen, a "supply and demand" model should be developed for the Basin waters. In order to develop this model, annual theoretical estimates of fish production should be substantiated, age structures of fish populations should be determined, sport and domestic harvests should be quantified, and methods of maintaining or enhancing existing levels of fish production in each lake should be developed.
3. In order to ascertain the effect of changes in environmental parameters, particularly changes in water levels likely to affect fish production, spawning and other key habitat should be located, migrational or seasonal movements should be determined, and water chemistry and temperature should be monitored.
4. Water quality criteria are recommended for the protection of fish and other aquatic life. Water quality in the Cold Lake - Beaver River Basin should be maintained at these standards. Water quality criteria should be revised and amended as new information becomes available.
5. Water quality criteria protective of fish and aquatic life should be established for the many organic-based pesticides that may be present or could be used in the Basin.

APPENDIX

TABLE XLVI

SUMMARY OF ANNUAL COMMERCIAL WHITEFISH HARVEST AND VALUES OF HARVESTS FROM THE COLD LAKE - BEAVER RIVER BASIN, 1970 - 1971 to 1980 - 1981

Year	Unit	Harvest	% of Provincial Whitefish Harvest	Value of Harvest to Fishermen	% of Value of Provincial Whitefish Harvest to Fishermen	Market Value of Harvest	% of Market Value of Provincial Whitefish Harvest
1970-71	kg lb	260,206 573,140	24.5%	$ 164,341	31.8%	$ 307,883	30.9%
1971-72	kg lb	212,282 467,582	21.4%	$ 139,194	28.3%	$ 255,865	27.3%
1972-73	kg lb	241,382 531,678	24.1%	$ 135,476	26.3%	$ 284,443	26.5%
1973-74	kg lb	237,834 523,863	24.0%	$ 155,616	26.0%	$ 301,300	28.1%
1974-75	kg lb	246,169 542,222	22.8%	$ 188,436	27.5%	$ 342,654	26.7%
1975-76	kg lb	233,425 514,153	22.4%	$ 201,309	25.3%	$ 329,208	24.0%
1976-77	kg lb	283,264 623,929	24.4%	$ 242,407	26.4%	$ 452,353	27.3%
1977-78	kg lb	243,903 537,231	22.5%	$ 236,257	27.0%	$ 351,578	25.0%
1978-79	kg lb	222,668 490,458	19.0%	$ 192,357	18.7%	$ 313,409	18.0%
1979-80	kg lb	235,972 519,763	20.4%	$ 241,435	18.8%	$ 419,211	20.9%
1980-81	kg lb	242,273 533,642	18.3%	$ 249,867	17.9%	$ 478,778	19.2%
Mean	kg lb	241,762 532,515	22.2%	$ 195,154	24.9%	$ 348,789	24.9%

TABLE XLVII

SUMMARY OF ANNUAL COMMERCIAL WALLEYE HARVEST AND VALUES OF HARVESTS FROM THE COLD LAKE - BEAVER RIVER BASIN, 1970 - 1971 to 1980 - 1981

Year	Unit	Harvest	% of Provincial Walleye Harvest	Value of Harvest to Fishermen	% of Value of Provincial Walleye Harvest to Fishermen	Market Value of Harvest	% of Market Value of Provincial Walleye Harvest
1970-71	kg lb	22,925 50,495	37.1%	$ 18,673	38.1%	$ 32,161	37.1%
1971-72	kg lb	28,081 61,853	36.0%	$ 21,857	33.9%	$ 44,974	36.9%
1972-73	kg lb	5,567 12,262	8.3%	$ 4,480	8.0%	$ 9,823	10.3%
1973-74	kg lb	3,914 8,622	9.6%	$ 5,528	14.1%	$ 7,196	10.1%
1974-75	kg lb	3,410 7,512	8.6%	$ 4,431	17.2%	$ 5,994	10.1%
1975-76	kg lb	3,578 7,882	15.8%	$ 5,096	25.3%	$ 6,524	15.6%
1976-77	kg lb	4,204 9,260	6.0%	$ 7,229	10.3%	$ 9,975	6.3%
1977-78	kg lb	3,789 8,346	3.0%	$ 6,179	4.5%	$ 8,564	3.2%
1978-79	kg lb	3,861 8,505	4.4%	$ 7,618	7.4%	$ 8,716	4.4%
1979-80	kg lb	5,508 12,132	6.2%	$ 12,726	9.8%	$ 17,020	7.1%
1980-81	kg lb	4,025 8,866	5.8%	$ 11,258	10.0%	$ 14,278	6.2%
Mean	kg lb	8,078 17,794	12.8%	$ 9,552	16.2%	$ 15,020	13.4%

TABLE XLVIII

SUMMARY OF ANNUAL COMMERCIAL PERCH HARVEST
AND VALUES OF HARVESTS FROM THE COLD LAKE -
BEAVER RIVER BASIN, 1970 - 1971 to 1980 - 1981

Year	Unit	Harvest	% of Provincial Perch Harvest	Value of Harvest to Fishermen	% of Value of Provincial Perch Harvest to Fishermen	Market Value of Harvest	% of Market Value of Provincial Perch Harvest
1970-71	kg lb	3,268 7,199	2.6%	$ 369	1.9%	$ 2,466	3.1%
1971-72	kg lb	1,543 3,399	2.5%	$ 307	3.0%	$ 1,035	2.5%
1972-73	kg lb	1,516 3,340	8.4%	$ 380	10.0%	$ 1,178	9.1%
1973-74	kg lb	618 1,361	8.2%	$ 159	15.5%	$ 506	9.1%
1974-75	kg lb	1,927 4,245	24.2%	$ 1,688	38.0%	$ 1,915	24.1%
1975-76	kg lb	1,258 2,770	16.3%	$ 1,064	31.1%	$ 1,393	22.2%
1976-77	kg lb	414 911	6.7%	$ 456	17.3%	$ 641	6.7%
1977-78	kg lb	887 1,954	13.4%	$ 808	21.1%	$ 1,369	16.4%
1978-79	kg lb	104 230	2.3%	$ 192	11.8%	$ 202	5.4%
1979-80	kg lb	1,118 2,462	16.4%	$ 1,491	24.5%	$ 2,308	21.8%
1980-81	kg lb	1,205 2,655	23.2%	$ 2,655	50.7%	$ 2,655	40.0%
Mean	kg lb	1,260 2,775	11.3%	$ 870	20.4%	$ 1,424	14.6%

TABLE XLIX

SUMMARY OF ANNUAL COMMERCIAL PIKE HARVEST AND VALUES OF HARVESTS FROM THE COLD LAKE - BEAVER RIVER BASIN, 1970 - 1971 to 1980 - 1981

Year	Unit	Harvest	% of Provincial Pike Harvest	Value of Harvest to Fishermen	% of Value of Provincial Pike Harvest to Fishermen	Market Value of Harvest	% of Market Value of Provincial Pike Harvest
1970-71	kg lb	75,459 166,209	21.8%	$ 16,179	23.2%	$ 35,810	22.4%
1971-72	kg lb	34,350 75,660	12.2%	$ 6,457	10.5%	$ 16,678	11.4%
1972-73	kg lb	63,930 140,816	23.0%	$ 13,948	22.0%	$ 33,660	23.4%
1973-74	kg lb	23,345 51,420	11.0%	$ 8,219	15.9%	$ 17,402	13.9%
1974-75	kg lb	21,287 46,888	10.2%	$ 12,205	18.6%	$ 14,752	8.7%
1975-76	kg lb	16,380 36,079	10.3%	$ 7,226	14.4%	$ 9,346	8.6%
1976-77	kg lb	15,924 35,076	8.8%	$ 10,104	19.9%	$ 16,101	9.6%
1977-78	kg lb	24,013 52,893	8.6%	$ 14,718	17.4%	$ 20,907	7.5%
1978-79	kg lb	22,452 49,453	7.8%	$ 15,474	12.4%	$ 24,637	7.9%
1979-80	kg lb	35,464 78,114	12.6%	$ 24,802	11.5%	$ 42,822	12.1%
1980-81	kg lb	31,474 69,326	10.0%	$ 24,781	11.7%	$ 41,293	10.0%
Mean	kg lb	33,098 72,903	12.4%	$ 14,010	16.1%	$ 24,855	12.3%

TABLE L

SUMMARY OF ANNUAL COMMERCIAL TULLIBEE HARVEST
AND VALUES OF HARVESTS FROM THE COLD LAKE -
BEAVER RIVER BASIN, 1970 - 1971 to 1980 - 1981

Year	Unit	Harvest	% of Provincial Tullibee Harvest	Value of Harvest to Fishermen	% of Value of Provincial Tullibee Harvest to Fishermen	Market Value of Harvest	% of Market Value of Provincial Tullibee Harvest
1970-71	kg	105,782	8.0%	$ 10,219	6.5%	$ 14,873	5.9%
	lb	233,001					
1971-72	kg	49,497	7.5%	$ 6,957	8.5%	$ 11,331	8.2%
	lb	109,024					
1972-73	kg	44,597	7.1%	$ 6,654	8.5%	$ 9,638	7.6%
	lb	98,231					
1973-74	kg	110,949	16.6%	$ 14,580	15.2%	$ 16,582	11.6%
	lb	244,382					
1974-75	kg	58,900	6.5%	$ 11,653	8.2%	$ 15,360	7.0%
	lb	129,736					
1975-76	kg	56,746	9.6%	$ 10,952	11.7%	$ 11,519	7.5%
	lb	124,992					
1976-77	kg	42,356	11.4%	$ 9,913	12.7%	$ 12,826	8.1%
	lb	93,296					
1977-78	kg	48,077	10.7%	$ 6,709	6.4%	$ 7,291	3.8%
	lb	105,897					
1978-79	kg	33,880	10.6%	$ 4,244	6.5%	$ 4,468	3.9%
	lb	74,625					
1979-80	kg	29,178	11.1%	$ 4,636	7.8%	$ 4,764	5.4%
	lb	64,269					
1980-81	kg	56,152	15.7%	$ 13,867	13.8%	$ 14,253	10.5%
	lb	123,682					
Mean	kg	57,829	10.4%	$ 9,126	9.6%	$ 11,173	7.2%
	lb	127,376					

TABLE LI

SUMMARY OF ANNUAL COMMERCIAL LING HARVEST AND VALUES OF HARVESTS FROM THE COLD LAKE - BEAVER RIVER BASIN, 1970 - 1971 to 1980 - 1981

Year	Unit	Harvest	% of Provincial Ling Harvest	Value of Harvest to Fishermen	% of Value of Provincial Ling Harvest to Fishermen	Market Value of Harvest	% of Market Value of Provincial Ling Harvest
1970-71	kg	26,775	27.5%	$ 1,920	23.1%	$ 2,447	26.7%
	lb	58,976					
1971-72	kg	20,152	10.7%	$ 1,631	10.3%	$ 1,760	9.4%
	lb	44,387					
1972-73	kg	14,652	17.2%	$ 1,557	22.7%	$ 1,582	22.7%
	lb	32,273					
1973-74	kg	24,084	22.9%	$ 2,280	33.7%	$ 2,280	33.7%
	lb	53,049					
1974-75	kg	21,861	30.1%	$ 2,380	46.6%	$ 2,380	46.6%
	lb	48,152					
1975-76	kg	19,262	.28.9%	$ 2,061	47.5%	$ 2,051	47.1%
	lb	42,428					
1976-77	kg	14,147	17.6%	$ 1,657	50.5%	$ 1,657	50.5%
	lb	31,160					
1977-78	kg	8,426	9.9%	$ 996	20.3%	$ 996	20.1%
	lb	18,559					
1978-79	kg	10,299	10.8%	$ 1,029	19.9%	$ 1,029	19.4%
	lb	22,686					
1979-80	kg	15,849	15.0%	$ 2,502	43.9%	$ 2,502	43.9%
	lb	34,910					
1980-81	kg	22,055	12.0%	$ 2,304	36.9%	$ 2,304	36.9%
	lb	48,579					
Mean	kg	17,960	18.4%	$ 1,847	32.3%	$ 1,908	32.4%
	lb	39,560					

TABLE LII
SUMMARY OF ANNUAL COMMERCIAL SUCKER HARVEST AND VALUES OF HARVESTS FROM THE COLD LAKE - BEAVER RIVER BASIN, 1970 - 1971 to 1980 - 1981

Year	Unit	Harvest	% of Provincial Sucker Harvest	Value of Harvest to Fishermen	% of Value of Provincial Sucker Harvest to Fishermen	Market Value of Harvest	% of Market Value of Provincial Sucker Harvest
1970-71	kg lb	17,472 38,484	14.9%	$ 903	22.7%	$ 904	22.7%
1971-72	kg lb	19,033 41,924	13.6%	$ 517	28.0%	$ 517	8.9%
1972-73	kg lb	10,427 22,967	8.1%	$ 538	21.7%	$ 538	9.4%
1973-74	kg lb	9,306 20,498	13.7%	$ 418	23.9%	$ 418	12.7%
1974-75	kg lb	3,561 7,844	5.8%	$ 190	7.5%	$ 190	7.5%
1975-76	kg lb	13,040 28,722	23.4%	$ 1,783	65.4%	$ 1,733	72.0%
1976-77	kg lb	12,194 26,860	12.9%	$ 994	47.9%	$ 994	47.9%
1977-78	kg lb	10,495 23,116	19.3%	$ 1,299	45.7%	$ 1,299	45.7%
1978-79	kg lb	16,609 36,584	20.7%	$ 1,460	62.4%	$ 1,460	56.7%
1979-80	kg lb	16,582 36,525	16.0%	$ 2,512	45.7%	$ 2,512	11.4%
1980-81	kg lb	17,419 38,368	7.6%	$ 1,531	73.7%	$ 1,531	73.7%
Mean	kg lb	13,285 29,263	14.2%	$ 1,104	40.4%	$ 1,100	33.5%

TABLE LIII

SUMMARY OF ANNUAL COMMERCIAL TROUT HARVEST AND VALUES OF HARVESTS FROM THE COLD LAKE - BEAVER RIVER BASIN, 1970 - 1971 to 1980 - 1981

Year	Unit	Harvest	% of Provincial Trout Harvest	Value of Harvest to Fishermen	% of Value of Provincial Trout Harvest to Fishermen	Market Value of Harvest	% of Market Value of Provincial Trout Harvest
1970-71	kg lb	1,389 3,060	82.3%	$ 1,836	85.0%	$ 1,836	85.0%
1971-72	kg lb	802 1,767	40.9%	$ 1,325	64.1%	$ 1,325	54.2%
1972-73	kg lb	584 1,286	27.0%	$ 1,161	60.9%	$ 1,161	43.4%
1973-74	kg lb	2,657 5,852	76.5%	$ 5,852	77.1%	$ 5,852	77.1%
1974-75	kg lb	1,601 3,527	99.2%	$ 4,403	99.7%	$ 4,403	99.7%
1975-76	kg lb	2,008 4,423	70.2%	$ 5,752	77.6%	$ 5,752	75.8%
1976-77	kg lb	1,765 3,887	50.7%	$ 5,830	74.9%	$ 5,830	63.0%
1977-78	kg lb	1,915 4,218	24.8%	$ 6,327	61.8%	$ 6,327	55.7%
1978-79	kg lb	1,029 2,266	47.4%	$ 3,820	77.8%	$ 3,820	54.3%
1979-80	kg lb	1,800 3,965	46.7%	$ 7,693	64.5%	$ 7,693	63.2%
1980-81	kg lb	2,021 4,451	64.1%	$ 9,374	84.5%	$ 9,374	84.5%
Mean	kg lb	1,597 3,518	57.2%	$ 4,852	75.3%	$ 4,852	68.7%

TABLE LIV

SUMMARY OF ANNUAL COMMERCIAL ROE HARVEST AND VALUES OF HARVESTS FROM THE COLD LAKE - BEAVER RIVER BASIN, 1970 - 1971 to 1980 - 1981

Year	Unit	Harvest	% of Provincial Roe Harvest	Value of Harvest to Fishermen	% of Value of Provincial Roe Harvest to Fishermen	Market Value of Harvest	% of Market Value of Provincial Roe Harvest
1970-71	kg lb			$		$	
1971-72	kg lb			$		$	
1972-73	kg lb			$		$	
1973-74	kg lb			$		$	
1974-75	kg lb			$		$	
1975-76	kg lb			$		$	
1976-77	kg lb			$		$	
1977-78	kg lb			$		$	
1978-79	kg lb	760 1,675	36.8%	$ 1,256	37.6%	$ 4,187	36.8%
1979-80	kg lb	2,601 5,728	56.7%	$ 7,159	56.7%	$ 45,824	56.7%
1980-81	kg lb	1,176 2,590	65.6%	$ 3,238	10.4%	$ 20,268	65.2%
Mean	kg lb	1,512 3,331	53.0%	$ 3,884	34.9%	$ 23,426	52.9%

TABLE LV
SUMMARY OF SIGNIFICANT FEATURES OF MAJOR FISH-PRODUCING WATERS OF THE COLD LAKE-BEAVER RIVER BASIN

	Major Fish Species Present*					Commercial Fisheries Production (lbs.)**					
Name of Lake or Stream	Whitefish	Walleye	Pike	Perch	Trout	+15,000	8-15,000	-8,000	Indian Domestic Fishery	Sport Fishery	A.R.D.A.-C.L.I Rating
Amisk Lake		X	X	X		X			X	X	N.I***
Amisk River			X	X						N.I.	2
Angling Lake			X							X	2
Bangs Lake		X	X	X				X	X	X	2
Beartrap Lake			X	X						X	1
Beaver Lake	X	X	X	X		X			X	X	1
Beaver River		X	X	X						X	N.I.
Bourque Lake	X	X	(L)	X				X		X	1
Burnt Lake (67-3-W4)	X	X						X	X	N.I.	N.I.
Burnt Lake (66-16-W4)			X							X	N.I.
Canoe Lake			X							N.I.	3
Caribou Lake			X							N.I.	2-3
Chatwin Lake					(RB)					X	2
Chickenhill Lake		X	(L)	X						N.I.	2
Chump Lake		X	X	X				X		X	N.I.
Cold Lake	X	X	X	X	(L)	X			X	X	1
Columbine Creek	NONE RESIDENT									N.I.	4
Corner Lake	NONE RESIDENT									N.I.	4
Elinor Lake	X	X	X	(L)				X	X	X	2
Ernestina Lake		X	X	X						X	1
Ethel Lake	X	X	X	X				X	X	X	1
Fisher Creek		N.		I.						N.I.	N.I.
Floatingstone Creek		N.		I.						N.I.	N.I.
Floatingstone Lake	X	X	X	X					X	X	1
Fork Creek		N.		I.						N.I.	4

* for pike or perch, (L) denotes presence of large size fish (pike over 8 lbs, perch over 1 lb); for trout, (RB) denotes rainbow, (L) denotes lake trout

** mean annual production based on the harvests over the number of years that the lake was fished between 1970-71 and 1980-81

*** N.I. : no information available

Name of Lake or Stream	Major Fish Species Present					Commercial Fisheries Production (lbs.)			Indian Domestic Fishery	Sport Fishery	A.R.D.A.-C.L.I. Rating
	Whitefish	Walleye	Pike	Perch	Trout	+15,000	8-15,000	-8,000			
Fork Lake	X		X	X			X		X	X	1
Frenchman Lake	X		X	X			X		X	X	1
Garner Lake		X	X	X						X	N.I.
Goodfish Lake	X	X	X	X					X	X	1
Greenstreet Lake			X	X						N.I.	4
Hasse Lake				X	(RB)					X	N.I.
Helena Lake	X	X	X			X			X	X	1
Hilda Lake		X	X	X			X			X	1
Honey Lake				X						N.I.	4
Ipiatik Lake	X		X				X			N.I.	N.I.
Ironwood Lake	X	X	X	(L)			X		X	X	1
Jackfish Creek		N.		I.						X	3
Kehiwin Lake		X	(L)	X		X			X	X	1
Kinosiu Lake			X	X						X	N.I.
Lane Lake		N.		I.						N.I.	4
Leming Lake			X	X						N.I.	2
Lodge Lake	X		X	X				X		X	N.I.
Lone Pine Lake	X		X	X					X	N.I.	N.I.
Long Lake		X	X	X						X	N.I.
Loseman Lake			X							N.I.	3
Manatokan Creek			X							N.I.	3
Manatokan Lake			X	X						X	2
Lower Mann Lake			X	X						X	2
Upper Mann Lake			X	X						X	1
Marie Creek	X	X	X							N.I.	2

Name of Lake or Stream	Major Fish Species Present					Commercial Fisheries Production (lbs.)			Indian Domestic Fishery	Sport Fishery	A.R.D.A.-C.L.I. Rating
	Whitefish	Walleye	Pike	Perch	Trout	+15,000	8-15,000	-8,000			
Marie Lake	X	X	X	X				X	X	X	1
Martineau River	X		X							N.I.	N.I.
May Lake	X	X	(L)	X						X	1
Medley River					(RB)					X	1
Minnie Lake			X	X						X	1
Missawawi Lake			X	(L)				X	X	X	N.I.
Moore Lake		X	X	X						X	1
Moose Lake	X	X	X	X		X			X	X	1
Mooselake River		X	X							X	3
Muriel Creek		NONE RESIDENT								N.I.	3
Muriel Lake	X	X	(L)			X			X	X	1
North Buck Lake	X	X	X	X		X			X	X	N.I.
Osborne Creek			X							N.I.	3
Pinehurst Lake	X	X	(L)			X			X	X	1
Primrose Lake	X	X	X			X				X	N.I.
Punk Creek			X	X						N.I.	2
Redspring Creek			X							N.I.	2
Reita Creek			X							X	3
Reita Lake			X					X		N.I.	2
Rich Lake			X						X		3
St. Lina Creek		N.	I.							N.I.	N.I.
Sand River (Lower)		N.	I.							N.I.	2
Scheltens Lake			X								3
Seibert Lake	X	X	(L)							X	1
Sinclair Lake			X							N.I.	4

ame of Lake or Stream	Major Fish Species Present					Commercial Fisheries Production (lbs.)			Indian Domestic Fishery	Sport Fishery	A.R.D.A.-C.L.I. Rating
	Whitefish	Walleye	Pike	Perch	Trout	+15,000	8-15,000	-8,000			
Skeleton Lake	X	X	X	X		X			X	X	N.I.
Soars Lake			X							N.I.	2
Spencer Lake	X	X	X			X				X	N.I.
Tawakwato Lake			X					X		X	N.I.
Thinlake		X	X							X	4
Thompson Lake			X					X		N.I.	2
Tompkins Lake		NONE RESIDENT									4
Touchwood Lake	X	X	(L)				X		X	X	1
Tucker Lake			X	(L)		X				X	2
Wayetenau Lake			X	X					X	X	2
Whitefish Lake	X	X	X	X		X			X	X	1
Wolf Lake	X	X	X	X		X			X	X	1
Wolf River		N.		I.						N.I.	N.I.

BIBLIOGRAPHY

AIKEN, D.E. 1967. Environmental regulation of molting and reproduction in the crayfish, Orconectes virilis (Hagen) in Alberta. Ph D Thesis, University of Alberta, Edmonton, Alberta.

AIKEN, D.E. 1968. Further extension of the known range of the crayfish, Orconectes virilis (Hagen). Nat. Mus. Can. Bull. 223:43-48.

ALABASTER, J.S. and R. LLOYD. 1980. Water Quality Criteria for Freshwater Fish. Food and Agriculture Organization of the United Nations and Butterworth and Co. (Publishers) Ltd. London. 297 p.

ALBERTA ENVIRONMENT. 1979. Alberta Surface Water Quality Objectives. Water Quality Branch, Standards and Approvals Division, Alberta Environment, Edmonton, AB. 17 p.

ALBERTA FISH AND WILDLIFE DIVISION. Undated. ARDA Sport Fish Capability Survey, Mapsheets 73-L, 73-M, and 83-I. Fisheries Branch, Alberta Fish and Wildlife Division.

ALBERTA FISH AND WILDLIFE DIVISION. Undated. Summary of the Coho Salmon Project at Cold Lake. Unpublished Report, Fisheries Branch, Alberta Fish and Wildlife Division. 6 p.

ALLAN, J.H. 1973. Report on the Trophy Lake Questionnaire: 1971-1972. Unpublished Report, Fisheries Branch, Alberta Fish and Wildlife Division. 12 p.

ALLAN, J.H. 1973. The Whitefish Fishery of Cold Lake. Unpublished Report, Fisheries Branch, Alberta Fish and Wildlife Division. 12 p.

ALLAN, J.H. 1975. A Method for Estimating the Potential Fish Production of Northern Alberta Lakes. Fisheries Management Report No. 19, Alberta Fish and Wildlife Division. 9 p.

AQUATIC ENVIRONMENTS LTD. 1978. Preliminary Investigations of Aquatic Resources in the Vicinity of the Imperial Oil Ltd. Cold Lake Lease. Aquatic Environments Ltd. 71 p.

BIDGOOD, B.F. 1966. Martineau River Survey. Unpublished Report, Fisheries Branch, Alberta Fish and Wildlife Division. 5 p.

BIDGOOD, B.F. 1975. Triaenophorus in Northern Alberta Lakes. Unpublished Report, Fisheries Branch, Alberta Fish and Wildlife Division. 25 p.

BIDGOOD, B.F. and J. DOONANCO. 1966. The Cold Lake Winter Commercial Fishery. Unpublished Report, Fisheries Branch, Alberta Fish and Wildlife Division. 13 p.

BIDGOOD, B.F. and J. DOONANCO. Undated. Comments on the Report "Cold Lake Winter Commercial Fishery". Unpublished Report, Fisheries Branch, Alberta Fish and Wildlife Division. 2 p.

BISHOP, F.G. 1971. A Report on the Trophy Lake Questionnaire, 1970-1971. Unpublished Report, Fisheries Branch, Alberta Fish and Wildlife Division. 11 p.

CARSS, J.E., C.E. STENTON and E.J. PSIKLA. 1978. The Impact of the Unlicenced Angler on the Sports Fishery in Alberta. Fisheries Management Report No. 26, Alberta Fish and Wildlife Division. 20 p.

CHAMBERLAIN, A., A. KELLER and D. MARALDO. 1980. Water Quality Requirements for Sport Fishes of the Grand River Watershed: A Literature Review. Grand River Basin Water Management Study Technical Report Series, Report No. 13, Ontario Ministry of Natural Resources, Cambridge, ON. 111 p.

CHARNEY, W. et al. 1979. Compilation of Data Describing Commercial Fisheries in the Cold Lake Area of Alberta and Saskatchewan. Prepared by Aquatic Environments Ltd. 76 p.

CROSS, P.M. 1979. Limnological and Fishery Surveys of the Aquatic Ecosystems at Esso Resources' Cold Lake Lease: Data Volume. Prepared by Aquatic Environments Ltd. 547 p.

DAVIS, J.C. 1975. Minimal Dissolved Oxygen Requirements of Aquatic Life with Emphasis on Canadian Species: A Review. J. Fish. Res. Board. Can. 32:2295-2332.

DEMAYO, A., M.C. TAYLOR and S.W. REEDER. 1979. Guidelines for Surface Water Quality. Volume 1, Inorganic Chemical Substances: Selenium. Inland Waters Directorate, Water Quality Branch, Environment Canada. 21 p.

DEMAYO, A., M.C. TAYLOR and S.W. REEDER. 1980. Guidelines for Surface Water Quality. Volume 1, Inorganic Chemical Substances: Lead. Inland Waters Directorate, Water Quality Branch, Environment Canada. 36 p.

GRIFFITHS, W.E. and D.B. FERSTER. 1974. Preliminary Fisheries Survey of the Winefred-Pelican Area. Fisheries Survey Report No. 19, Alberta Fish and Wildlife Division. 449 p.

HYDROGEOLOGICAL CONSULTANTS LTD. 1974. Pinehurst, Seibert and Touchwood Lakes. Hydrogeological Consultants Ltd. 199 p.

INTERNATIONAL JOINT COMMISSION. 1977. New and Revised Great Lakes Water Quality Objectives. International Joint Commission, Windsor, ON. Vol. I, 55 p., Vol. II, 155 p. (cited in Chamberlain et al 1980).

LEWIS, M. 1976. Effects of Low Concentrations of Manganous Sulfate on Eggs and Fry of Rainbow Trout. Prog. Fish. Cult. 38(2):63-65.

LONGMORE, L.A. and C.E. STENTON. 1981. The Fish and Fisheries of the South Saskatchewan River Basin: Their Status and Environmental Requirements. Prepared for Planning Division, Alberta Environment. 335 p.

LOWE, D. 1978. Test netting Long Lake (63-19-W4). Unpublished Memo from D. Lowe (Regional Fisheries Biologist, St. Paul) to C.E. Stenton (Section Head, Fisheries Management) June 21, 1978. Fisheries Branch, Alberta Fish and Wildlife Division. 2 p.

LOWE, D. 1980. Seibert Lake: Regulation Changes. Unpublished Memo from D. Lowe (Regional Fisheries Biologist, St. Paul) to C.E. Stenton (Section Head, Fisheries Management) October 24, 1980. Fisheries Branch, Alberta Fish and Wildlife Division. 4 p.

LOWE, D. and K. MOLLER. 1974. Preliminary Survey of Six Lakes in the D.N.D. Bombing Range, Cold Lake, Alberta. Unpublished Report, Fisheries Branch, Alberta Fish and Wildlife Division. 4 p.

MAKOWECKI, R. 1973. The Trophy Pike (*Esox lucius*) of Seibert Lake. MSc Thesis, University of Alberta, Edmonton, Alberta. 239 p.

MAKOWECKI, R. 1973. The Trophy Pike of Seibert Lake. Fisheries Research Report No. 10, Alberta Fish and Wildlife Division. 46 p.

McCART, P.J. et al. 1979. Limnological and Fishery Surveys of the Aquatic Ecosystem at Esso Resources' Cold Lake Lease. Prepared by Aquatic Environments Ltd. 267 p.

McDONALD, D. 1963. Report on the Moose Lake Creel Census: 1963. Unpublished Report, Fisheries Branch, Alberta Fish and Wildlife Division. 6 p.

McDONALD, D. 1964. Lake Survey Report: Seibert Lake. Unpublished Report, Fisheries Branch, Alberta Fish and Wildlife Division. 8 p.

McDONALD, D. 1964. Moose Lake Creel Census Study. Unpublished Report, Fisheries Branch, Alberta Fish and Wildlife Division. 14 p.

McDONALD, D. 1966. Ironwood Lake. Unpublished Report, Fisheries Branch, Alberta Fish and Wildlife Division. 27 p.

McDONALD, D. 1967. Kehiwin Lake. Unpublished Report, Fisheries Branch, Alberta Fish and Wildlife Division. 45 p.

McDONALD, D. 1967. Moose Lake. Unpublished Report, Fisheries Branch, Alberta Fish and Wildlife Division. 59 p.

McDONALD, D. 1967. Muriel Lake. Unpublished Report, Fisheries Branch, Alberta Fish and Wildlife Division. 40 p.

McDONALD, D. 1968. Trophy Fishing in Alberta. Fisheries Branch, Alberta Fish and Wildlife Division. 6 p.

McDONALD, D. 1969. The Interrelationship of Various Biological, Social and Economic Factors in the Sport Fishery of Moose Lake, Alberta. Fisheries Research Report No. 3, Alberta Fish and Wildlife Division. 29 p.

McDONALD, D. 1969. Lake Survey Report: Pinehurst Lake. Unpublished Report, Fisheries Branch, Alberta Fish and Wildlife Division. 16 p.

McNEELY, R.N., V.P. NEIMANIS and L. DWYER. 1979. Water Quality Sourcebook: A Guide to Water Quality Parameters, Inland Waters Directorate, Water Quality Branch, Environment Canada, Ottawa, ON. 89 p.

MILLER, R.B. 1943. Muriel Lake Whitefish. Unpublished Report, Fisheries Branch, Alberta Fish and Wildlife Division. 1 p.

MILLER, R.B. 1946. Effectiveness of a Whitefish Hatchery. J. Wildl. Mgmt. 10(4):316-322.

MILLER, R.B. 1946. Report on Cold Lake. Unpublished Report, Fisheries Branch, Alberta Fish and Wildlife Division. 12 p.

MILLER, R.B. 1947. Report on Skeleton Lake. Unpublished Report, Fisheries Branch, Alberta Fish and Wildlife Division. 5 p.

MILLER, R.B. 1952. The Relative Strength of Whitefish Year Classes as Affected by Egg Plantings and Weather. J. Wildl. Mgmt. 16(1):39-50.

MILLER, R.B. 1955. Notes on Crane and Soars Lakes and Three Potholes in the Bonnyville Area. Unpublished Report, Fisheries Branch, Alberta Fish and Wildlife Division. 5 p.

MILLER, R.B. 1956. The January 1956 Tests on Cold Lake. Unpublished Report, Fisheries Branch, Alberta Fish and Wildlife Division. 5 p.

MILLER, R.B. 1956. The Management of the Fish Resources of Cold Lake. Unpublished Report, Fisheries Branch, Alberta Fish and Wildlife Division. 13 p.

MILLER, R.B. and M.J. PAETZ. 1953. Preliminary Biological Surveys of Alberta Watersheds: 1950-1952. Published by the Dept. of Lands and Forests, Government of Alberta. 114 p.

MOLLER, K.M. 1971. Results of the 1971 Creel Census: St. Paul Region. Unpublished Report, Fisheries Branch, Alberta Fish and Wildlife Division. 21 p.

MOLLER, K.M. 1972. Progress Report on the Coho Project in Cold Lake, June 1972. Unpublished Report, Fisheries Branch, Alberta Fish and Wildlife Division. 5 p.

MOLLER, K.M. 1972. Results of the 1972 Licence Plate Census of Angling Pressure: St. Paul Region. Unpublished Report, Fisheries Branch, Alberta Fish and Wildlife Division. 8 p.

MOLLER, K.M. 1974. Introduction of Coho Salmon into Cold Lake: A Summary of 1970-1974 Results. Unpublished Report, Fisheries Branch, Alberta Fish and Wildlife Division. 64 p.

MOLLER, K.M. 1974. The Whitefish Fishery of Beaver Lake. Unpublished Report, Fisheries Branch, Alberta Fish and Wildlife Division. 13 p.

NATIONAL ACADEMY OF SCIENCE/NATIONAL ACADEMY OF ENGINEERING. 1973. Water Quality Criteria 1972. E.P.A. Ecol. Res. Ser. E.P.A. -R3-73-003. U.S. Environmental Protection Agency, Washington, D.C. 594 p.

PATERSON, R.J. 1960. Lake Survey Report: Denning Lake. Unpublished Report, Fisheries Branch, Alberta Fish and Wildlife Division. 1 p.

PINSENT, M.E. 1967. A Comparative Limnological Study of Lac La Biche and Beaver Lake, Alberta. MSc Thesis, University of Alberta, Edmonton, Alberta. 149 p.

RAMSAROOP, P.M. and J.R. CARD. 1978. Areas of Drainage Basins Within Alberta. Hydrology Branch, Technical Services Division, Alberta Environment. 16 p.

RHUDE, L. 1976. Preliminary Fisheries Survey of the Lakes and Rivers found in the Winnifred Lake Study Area. Unpublished Report, Fisheries Branch, Alberta Fish and Wildlife Division. 272 p.

RHUDE, L. 1978. Methodology for the Sport Fish Capability Classification Within Alberta for the Canada and Alberta Land Inventories. Alberta Fish and Wildlife Division. 24 p.

ROBERTS, W.E. 1975. Food and Space Utilization by the Piscivorous Fishes of Cold Lake with Emphasis on Introduced Coho Salmon. MSc Thesis, University of Alberta, Edmonton, Alberta. 145 p.

ROBERTSON, M.R. 1969. An Investigation of a Spawning Population of Northern Pike from Floatingstone, Alberta. Fisheries Research Report No. 5, Alberta Fish and Wildlife Division. 57 p.

ROBERTSON, M.R. 1969. Whitefish Lake, Alberta Unpublished Report, Fisheries Branch, Alberta Fish and Wildlife Division. 56 p.

ROBERTSON, M.R. 1970. Results of the 1969 St. Paul Regional Creel Census. Unpublished Report, Fisheries Branch, Alberta Fish and Wildlife Division. 8 p.

ROBERTSON, M.R. 1970. Status Report on Residue Analyses in Northeastern Alberta. Unpublished Report, Fisheries Branch, Alberta Fish and Wildlife Division. 4 p.

ROBERTSON, M.R. 1970. Wolf Lake. Unpublished Report, Fisheries Branch, Alberta Fish and Wildlife Division. 46 p.

ROBERTSON, M.R. and J.H. ALLAN. 1971. Results of the 1970 Regional Creel Census, St. Paul Region. Unpublished Report, Fisheries Branch, Alberta Fish and Wildlife Division. 17 p.

SENG, R.L.T. 1975. Metazoan Parasites of Fishes of Cold Lake, Alberta: A Community Analysis. MSc Thesis, University of Alberta, Edmonton, Alberta. 170 p.

SKINNER, D. 1979. An Assessment of Agricultural and Recreational Impact on Water Quality in Northeastern Alberta Lakes. Unpublished Report, Fisheries Branch, Alberta Fish and Wildlife Division. 18 p.

SMITH, S.B. 1970. Coho Salmon Program in Cold Lake. Unpublished Report, Fisheries Branch, Alberta Fish and Wildlife Division. 3 p.

STATISTICS CANADA. 1980. Canada Year Book 1978-79. Information Division, Statistics Canada. 977 p.

TAYLOR, B.W. 1977. Test Netting Floatingstone Lake to Evaluate it for a Potential Commercial Fishery. Unpublished Report, Fisheries Branch, Alberta Fish and Wildlife Division. 17 p.

TAYLOR, M.C. and A. DEMAYO. 1980. Guidelines for Surface Water Quality. Volume I, Inorganic Chemical Substances: Zinc. Inland Waters Directorate, Water Quality Branch, Environment Canada. 52 p.

TAYLOR, M.C., A. DEMAYO and S.W. REEDER. 1979. Guidelines for Surface Water Quality. Volume 1, Inorganic Chemical Substances: Nickel. Inland Waters Directorate, Water Quality Branch, Environment Canada. 12 p.

TAYLOR, M.C., A. DEMAYO and S.W. REEDER. 1980. Guidelines for Surface Water Quality. Volume 1, Inorganic Chemical Substances: Silver. Inland Waters Directorate, Water Quality Branch, Environment Canada. 14 p.

THOMAS, R.C. 1955. Report on Some Lakes in the St. Paul District. Unpublished Report, Fisheries Branch, Alberta Fish and Wildlife Division. 2 p.

THOMAS, R.C. 1963. Report on Moose Lake Creel Census. Unpublished Report, Fisheries Branch, Alberta Fish and Wildlife Division. 6 p.

THOMAS, R.C. and D. McDONALD. 1963. Long Lake Survey. Unpublished Report, Fisheries Branch, Alberta Fish and Wildlife Division. 7 p.

THURSTON, R.V. and R.C. RUSSO. 1978. Acute Toxicity of Ammonia and Nitrate to Cutthroat Trout Fry. Trans. Am. Fish. Soc. 107(2):361-368.

THURSTON, R.V., R.C. RUSSO, C.M. FETTEROLF JR., T.A. EDSALL and Y.M. BARKER JR. (Eds). 1979. A Review of the E.P.A. Red Book: Quality Criteria for Water. Water Quality Section, American Fisheries Society, Bethesda, M.D. 313 p.

TSUI, P.T.P. and P.J. McCART. 1979. Acute Toxicity of Produced Water and Bitumen/Water Mixture from an In-Situ Heavy Oil Extraction Pilot Plant in Cold Lake, Alberta. Preliminary Report. Prepared by Aquatic Environments Ltd. 38 p.

TSUI, P.T.P. and P.J. McCART. 1979. A Baseline Study of Chlorinated Hydrocarbon Residues and Heavy Metals in Several Fish Species from Esso's Cold Lake Project Area. Prepared by Aquatic Environments Ltd. 46 p.

TSUI, P.T.P. et al. 1978. Winter Limnological Studies of the Cold Lake Project Area. Prepared by Aquatic Environments Ltd. 93 p.

U.S. ENVIRONMENTAL PROTECTION AGENCY. 1976. Quality Criteria for Water. U.S. Environmental Protection Agency, Washington, D.C. 256 p.

WALKER, R.G. and G.A. CLAPP. 1980. A Creel Census of Wolf Lake, Alberta. Unpublished Report, Fisheries Branch, Alberta Fish and Wildlife Division. 25 p.

WATTERS, D.V. 1980. Bourque Lake Limnological Survey. Unpublished Report, Fisheries Branch, Alberta Fish and Wildlife Division. 44 p.

WATTERS, D.V. 1980. Dissolved Oxygen Testing Schedule for St. Paul Fisheries Region, 1979-1980. Unpublished Memo from D.V. Watters (Fisheries Technician, St. Paul) to C.E. Stenton (Section Head, Fisheries Management) March 25, 1980. Fisheries Branch, Alberta Fish and Wildlife Division. 4 p.

WATTERS, D.V. 1980. Ernestina Lake Limnological Survey. Unpublished Report, Fisheries Branch, Alberta Fish and Wildlife Division. 35 p.

WATTERS, D.V. 1980. Frenchman Lake Limnological Survey. Unpublished Report, Fisheries Branch, Alberta Fish and Wildlife Division. 41 p.

WATTERS, D.V. 1980. Minnie Lake Limnological Survey. Unpublished Report, Fisheries Branch, Alberta Fish and Wildlife Division. 35 p.

WATTERS, D.V. 1980. Moore Lake Limnological Survey. Unpublished Report, Fisheries Branch, Alberta Fish and Wildlife Division. 37 p.

WATTERS, D.V. 1980. Sinclair Lake Limnological Survey. Unpublished Report, Fisheries Branch, Alberta Fish and Wildlife Division. 32 p.

WESTIN, D.T. 1974. Nitrate and Nitrite Toxicity to Salmonid Fishes. Prog. Fish. Cult. 36(2):86-89.

APPENDIX I

WATER RELATED WILDLIFE RESOURCES

A Report Prepared By
B. RIPPON,
N.E. REGIONAL WILDLIFE BIOLOGIST
ALBERTA ENERGY AND NATURAL RESOURCES

Alberta
ENERGY AND
NATURAL RESOURCES

MEMORANDUM

FROM *Ray Makowecki*
Regional Director
N.E. Region

TO *C. Primus*
Director, Planning Division
Alberta Environment

OUR FILE REFERENCE

YOUR FILE REFERENCE

DATE *May 19, 1983*

TELEPHONE *645-6313*

UBJECT *Re: Wildlife report: Cold Lake - Beaver River Basin*

We are pleased to submit the original copy of the report entitled Water Related Wildlife Resources in the Beaver River Watershed, as requested, for inclusion in the appendix to the Cold Lake - Beaver River Basin Water Management Study.

If there are any questions regarding this report, please do no hesitate to call.

G. Hamilton

for *R. Makowecki*
Regional Director
N.E. Region

RM:lb
cc. Rippin - Hamilton - file

WATER RELATED WILDLIFE RESOURCES IN THE BEAVER RIVER WATERSHED

Background

As a result of requests from the oil industry for significant amounts of water required for steam injection recovery of heavy crude oil in the Cold Lake area, the Beaver River Water Resource Study (BRWRS) was initiated in 1981. The coordinating function was assumed by the Department of Environment. The ultimate objective of the study is to determine the quantity and location of water extraction available for industrial, urban and domestic uses. The design of the study includes provisions to determine the effect of various extraction regimes on all water related resources in the Beaver River basin.

The study is segregated into stages which allows the orderly development toward the final objective outlined above. Stage one is directed toward documenting existing resources. Stage two is designed to identify the sensitivity of various resources and outline resource concerns as they relate to water level and flow rate manipulation.

This report addresses stage one and two with respect to the water associated wildlife resources in the Beaver River Basin.

Introduction

The Beaver River watershed covers part of two major ecological zones: (1) boreal mixed-wood in the north half with outlying portions in the south-east and west; (2) northern aspen dominated parkland in the south. Soil fertility is variable but much of the area consists of grey-wooded soils underlain by glacial till which is strongly influenced by past glaciation. This has resulted in the existence of a great number of diverse lakes, slough and low gradient, meandering streams.

Agricultural and industrial activity which result in dramatic landscape changes is restricted to the limited areas of better soil. Consequently the basin presently supports an unusual abundance and variety of wildlife, many species of which are associated with the lakes and wetlands. Also, because of the relative pristine nature of the area, a number of rare and/or sensitive species still maintain a strong hold. Most of these are dependent upon the existing water regime in the basin.

Methods

The wildlife resource of any specific area generally consists of a diverse array of species each with different habitat requirements. As such, an evaluation of wildlife values on a particular land base is a difficult task. Assessments in practice have however usually centered around a few key species in order to simplify sampling.

Waterbodies present an even more formidable task because there are no completely aquatic inland species of wildlife. Those semi-aquatic types present are dependent upon the waterbody but also make use of submerged and emergent vegetation along the shore as well as cover on the surrounding area.

For the purpose of the Beaver River Water Resource Study, documentation of water related wildlife and assessment of sensitivity to water manipulation considered a number of parameters which are outlined below:

1) Assessment of suitability for waterfowl, water associated avifauna and semi-aquatic mammals.

Routine investigations of waterbodies in the Northeast Region conducted by Fish and Wildlife Division personnel over the past few years (augmented by 2 students provided by the Department of Environment during the summer of 1981) consisted of making a circuit round the shoreline of each waterbody during June and July and mapping existing emergent, shoreline and backshore vegetation. Maximum depths were recorded as well as the locations of inlet and outlet streams. Counts of waterfowl and water associated avaifauna were conducted to determine number of individuals, species and behaviour, e.g. nesting, molting or foraging; also mammal signs were recorded along the shoreline transects.

The following index to assess relative suitability for waterfowl was developed using the above in addition to waterbody size and configuration.

Lakes with an index of 15 or greater are considered excellent production lakes for shallow water species, i.e. surface feeding waterfowl, some grebes, muskrat. Indices of 10 but less than 15 are considered good producers; 6 to 10 are fair while less than 6 are considered poor. However, lakes having lower indices and receiving relatively light recreational or other uses are often important for supporting some of the more rare species such as osprey, eagle, western grebe and river otter.

Waterfowl Productivity Index Calculations - Beaver River Basin

	(example)
a---area (sq. km.)	3.5
b---shoreline (km)	13.5
c*--degree of development	4
d---$\frac{1}{\text{maximum depth (m)}}$	0.3
e---number of bird *** species per shoreline km	1.3
f**-number of birds per shoreline km	5
g****Vegetation diversity	4
Σcdefg-index	14.6

*degree of development

$$\frac{\text{Shoreline (km)}}{2\sqrt{\pi \times \text{Area}}}$$

≥ 1 < 1.4 = 1

≥ 1.4 < 1.7 = 2

≥ 1.7 < 2.0 = 3

≥ 2.0 < 3.0 = 4

≥ 3.0 < = 5

***bird=waterfowl or water associated birds

** $\frac{\text{\# Birds}}{\text{Shoreline (km)}}$

≥ 1 < 11 = 1

≥ 11 < 31 = 2

≥ 31 < 51 = 3

≥ 51 < 101 = 4

≥ 101 < 201 = 5

≥ 201 < = 10

****Vegetation diversity

1. Very limited emergents and few shoreline types
2. Greater diversity
3. Greater diversity
4. Greater diversity
5. Very diverse emergents and shoreline types.

2) Special features such as the presence of rare and/or sensitive species, surrounding land use, recreational use, water level controls, etc. were recorded and are considered.

3) Sensitivity assessments were based on known habitat requirements of species present and expected effect of mean water level increases and decreases, considering resulting changes in wave action, ice scouring, emergent and submergent vegetation, lake portitioning, island creation or disappearance, etc.

Considering the existing importance to wildlife and the degree of sensitivity to water level manipulation each waterbody was given a rank (BRWRS rank) of 1 to 10 predicated by letters A, B, or C. The numbers indicate the relative importance of the waterbody to wildlife in general (1 being of greatest importance) while the letter indicates the degree of sensitivity to level manipulation (A being most sensitive to water manipulation) (BRWRS ranks are on the summary sheets only).

Results

The following is an assessment of each waterbody with respect to its value to wildlife and sensitivity to level manipulation. Waterbodies are listed in order of subwatershed as identified on the Beaver River Water Resource Study base map.

WOLF LAKE RIVER SUBWATERSHED (Fig. W1)

The Wolf Lake River Subwatershed lies entirely within the boreal mixed-wood ecosystem. It is characterized in the north and east by flat to gently rolling, poorly drained topography giving rise to low-gradient, meandering streams and small waterbodies associated with extensive areas of sphagnum-black spruce bog. Uplands, scattered throughout, are forested with multi-aged, mixed stands of white spruce-balsam or aspen poplar. Toward the southwest, relief becomes more pronounced with uplands in many areas covered predominantly with aspen poplar. Pockets of white spruce, mature balsam poplar-birch and black spruce occur sporadically. Riparian areas of willow and alder are often associated with streambanks and lake shores.

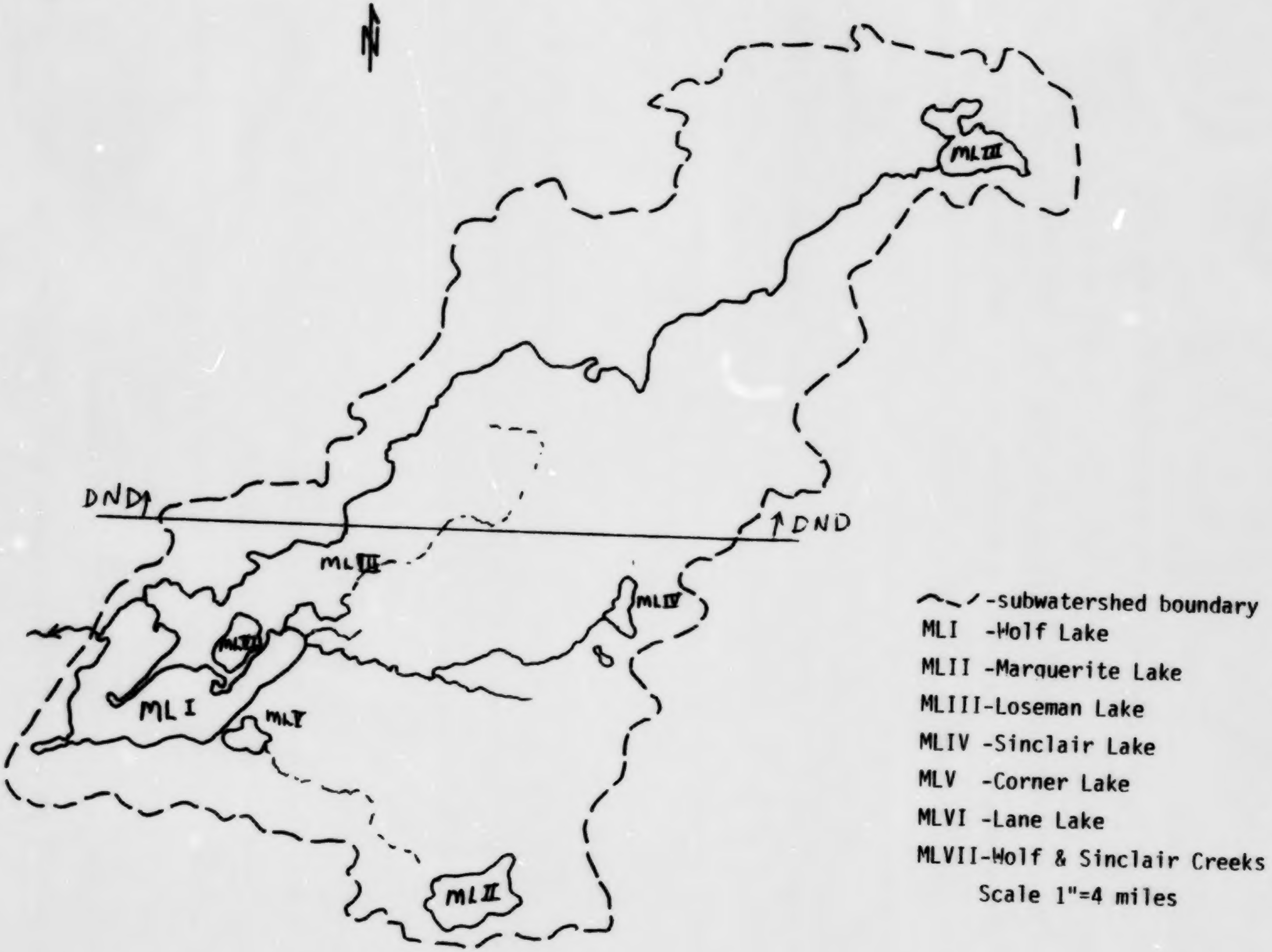
The diversity of cover types and topography in conjunction with the almost total absense of permanent human habitation (1/2 of the watershed is within the Primrose Air Weapons Range - a restricted access area) makes the watershed one of the most pristine and containing the most diverse and abundant wildlife complement in the Beaver River Water Resource Study Area.

Upland wildlife is characterized by mixed wood species including moose, white-tailed and mule deer, black bear, wolf, caribou, snowshoe hare, weasel, red squirrel, coyote, fisher, fox and a variety of avifauna including grouse, raptors and small birds.

The greatest variety of wildlife is however that associated with water. Semi-aquatic mammals including beaver, mink, and river otter occur in more

WOLF LAKE SUBWATERSHED

Figure WI


N
DND
DND
MLIII
MLIII
MLIV
MLVI
ML I
MLV
MLII
-subwatershed boundary
MLI -Wolf Lake
MLII -Marquerite Lake
MLIII-Loseman Lake
MLIV -Sinclair Lake
MLV -Corner Lake
MLVI -Lane Lake
MLVII-Wolf & Sinclair Creeks
Scale 1"=4 miles

relative abundance than in most other areas of the province (see table II for fur value).

Water associate avifauna includes representatives from the mixed-wood such as diving ducks, western grebes and mergansers as well as many from the parkland probably because of its relatively close proximity and habitat suitability. These include many surface feeding ducks, coots and grebes.

Perhaps the most unique however are the presence of several species which are considered rare and/or sensitive including osprey, western grebe, blue heron, turkey vulture, common tern and white pelican.

Wolf Lake (Including Corner and Lane Lakes)

Because of the wide variations in water depth, shoreline configuration, back-shore topography and vegetation cover coupled with numerous incoming streams and closely associated smaller waterbodies, Wolf Lake, the largest in the watershed, offers an unusually unique diversity of wildlife habitat types. This is consequently reflected in the wildlife species present. The most abundant species on the lake are surface feeding and diving ducks including mallard, wigeon, goldeneye, blue-winged teal, and bufflehead. Coot and red-necked grebe are also numerous. Semi-aquatic mammals include beaver (5 active lodges), mink, muskrat, and river otter.

The most unique feature of the lake is the presence of: 1) a western grebe colony (145 nests in 1981) - one of six in the Beaver River Water Resource Study area and representing approximately 5% of the provincial population, 2)

TABLE II

Wolf Lake River Subwatershed - Value of Semi-Aquatic Fur Bearer Trapping, 1978-1981

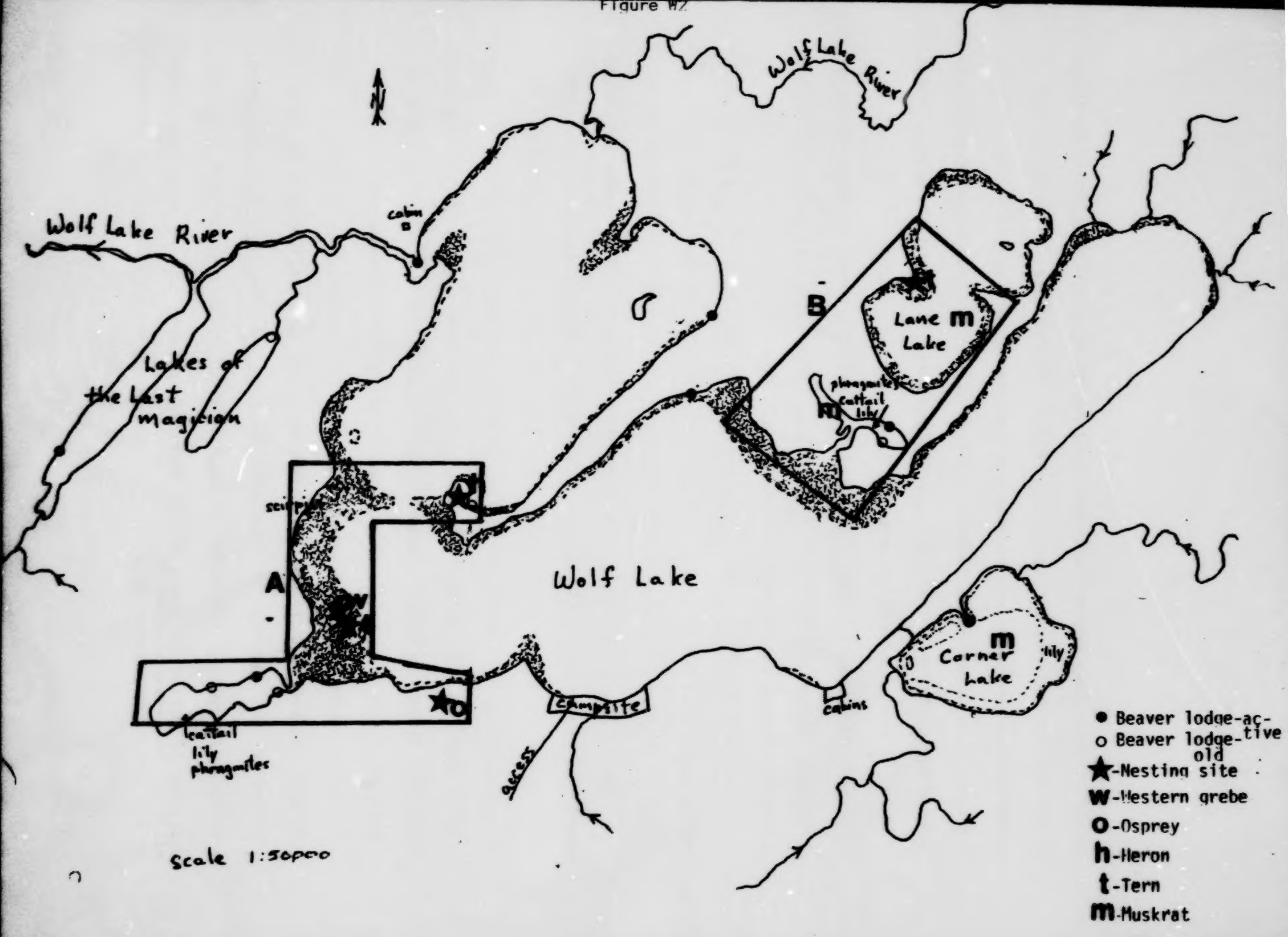
	Beaver		Mink		Muskrat		Otter		Total	
	#	$	#	$	#	$	#	$	#	$
1978-79	182	5842	37	1034	188	987	8	694	415	8557
1979-80	184	7342	39	1279	81	535	7	446	311	9601
1980-81	245	7386	20	608	217	1259	9	419	491	9671
Mean	204	6856	32	974	162	927	8	505	406	9262
% of total BRWRS area	14.98		10.25		4.25		15.7		11.54	

Wolf Lake River Subwatershed comprises 3.3% of the total Beaver River Basin.

Value per sq. mile = $79.00 (116 sq. miles trapped)

Provincial averages for all fur bearers ranged from $7.00 to $68.00/sq. mi. in 1970-1975.

WOLF LAKE
Figure W2


Wolf Lake River
Wolf Lake River
cabin
Lakes of the Last Magician
B
Lane Lake
m
phragmites
cattail
lily
m
A
scirpus
w
Wolf Lake
cattail
lily
phragmites
campsite
access
cabins
Corner Lake
m
lily
● Beaver lodge-active
○ Beaver lodge-old
★-Nesting site
W-Western grebe
O-Osprey
h-Heron
t-Tern
m-Muskrat
Scale 1:50000

blue heron colony (20 nests in 1981) and one of five in the Beaver River Water Resource Study area, 3) common tern colony (approximately 100 nests) one of three known in the Beaver River Water Resource Study area, 4) colony of eared grebes (size unknown-Lane Lake), 5) active osprey nest - one of approximately 10 in the study area, and 6) turkey vulture nest (one pair nesting with herons in 1980), one of 2 known pairs in the study area.

The rating for waterfowl production is 10.56 which is only moderate. However there are three specific areas of particular importance which are described below.

Area A (Fig. W2)

This area is relatively shallow much of which is 1.5 m in the depth and contains the western grebe colony, heron colony, tern colony and osprey nest. The dependency of these species on water near 1m deep is described below:

(a) Western grebe - Although the majority of their life is spent in deep water foraging for small fish, the courtship and nesting period requires shallow water (1.5m) where emergent vegetation - usually scirpus or phragmites - is used to construct floating nests.

Water depth, bottom gradient and geographic orientation influences the effects of wave action and ice scour which in turn influences the extent, diversity and density of emergent shoreline vegetation. Western grebe colonies are generally located in relatively extensive beds of medium density scirpus or phragmites where winter carryover of dead nesting material allows nest building and secure anchoring with easy underwater access during May and June. (Gunderson, (1982) and Nuechterlein, (1975)*). The combination of depth and bottom gradient on the southwest shore appears to meet these requirements. Deeper water would allow greater wave action and ice scour which would decrease bed size and decrease scripus stem density. Shallower water increases stem density and decreases under water access.

(b) Common terns also depend on winter carryover of floating nesting material. In addition, foraging is done most effectively in shallow water.

(c) Blue herons, although tree nesters, forage in shallows where wading is possible. Their food is obtained in water 0.5m.

(d) Osprey depend on their ability to sight prey under the surface of the water as they fly over hunting areas. Algae, general turbidity and wave action reduce this capability. Protected shallows (1-2m) which place prey near the surface and where wave action is reduced are necessary for effective osprey foraging.

A reduction in level of 0.2m would increase emergent vegetation density and bed area to the detriment of the above species (see McGregor 1982). Increase of 0.5m would likely be tolerated but increases beyond 0.5m would result in decreased area useful for foraging and nesting.

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*Gunderson, G. 1981. Summary of Report of Western Grebe Investigations in Northeastern Alberta, 1978-1980.

*Nuechterlien, G.L. 1975. Nesting ecology of western grebes on the Delta Marsh, Manitoba. Unpub. M.Sc. thesis, Colorado State University, Denver 101 p.

Area B (Fig. W2)

Much of area B, including part of Lane Lake, consists of marsh-like habitat with water generally 1.5m in depth. The mosaic of emergent vegetation (carex, cattail, phragmites and scripus) and open water with a low gradient back shore creates an ideal situation for the production of surface feeding waterfowl, muskrats, beaver, and a variety of other marsh wildlife. The area also includes colonies of common terns and eared grebes.

The marsh nature of the area is a result of the low gradient bottom and shallow water reducing wave action and ice scour. A decrease in waterlevel of 0.2m would reduce open water area and reduce its value to wildlife. An increase of 0.5m would likely increase the total marsh area between the two lakes and increase its value. However increases above 0.5m would result in detrimental wave action and ice scour reducing diversity and value to wildlife.

Area C (not included on map)

This area includes all incoming streams and the four closely associated waterbodies.

The value of Wolf Lake to waterfowl, water associated birds and semi-aquatic mammals is greatly enhanced by the above waterbodies. Most of the beaver, muskrat, mink, and otter production takes place in these associated areas. Although the lakes are relatively shallow (2m) and the streams are intermittent, their existence is strongly influenced by Wolf

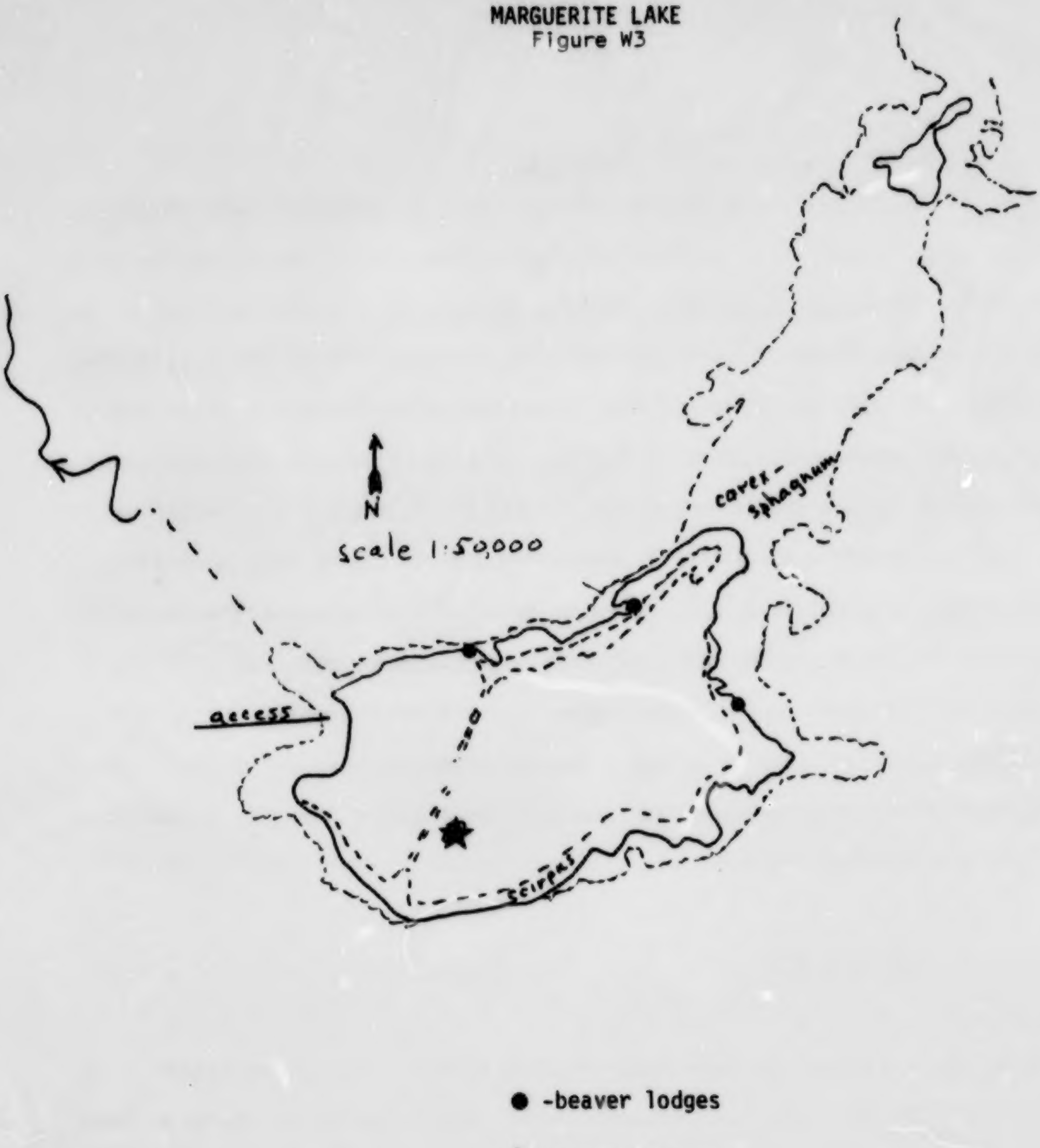
Lake. In particular the winter period is of greatest importance to semi-aquatic fur bearers - particularly beaver and otter. These species must have sufficient water to prevent complete freezing of the stream in order to maintain access to their food source. The slow release of water from the extensive areas of bog in the basin is a significant factor contributing to low but continuous winter flows. Any manipulation of waterbodies upstream or downstream will influence flow rates in the streams and water level fluctuations in Wolf Lake will directly affect levels in the associated lakes.

In general, significant increases in level will reduce the area suitable for foraging and breeding of wildlife. Significant reductions will either reduce suitable area or increase emergent vegetation density thus reduce suitability. Significant annual drawdowns (± 1m) will reduce suitable area available by changing emergent bed area and/or density; emergent composition and increase water turbidity.

MARGUERITE LAKE (Fig. W3)

Marguerite Lake is a relatively shallow boreal lake associated with an extensive area of carex and sphagnum-ledum bog. Medium to dense scirpus surrounds much of the lake with one band extending across it's width. The most common species using the lake are lesser scaup, mallard, white-winged scoter and wigeon. It has a productivity index of 11.75 indicating fair to good for waterfowl. Use by beaver and muskrat is only moderate.

MARGUERITE LAKE
Figure W3


N
scale 1:50,000
carex-sphagnum
access
scirpus

● -beaver lodges

★ -heron colony

Rare species include a small blue heron nesting colony (3 - 5 nests) on the central island and the lake is used for foraging by white pelicans.

Maximum depth is 4 - 5 meters but most of the lake is less than 2 meters. A significant decrease in water depth would result in considerable encroachment of scirpus but would likely expose more points or islands. This would increase the lake's value to some waterfowl and muskrat. A significant increase would flood the sphagnum-ledum area to the north-east. Although surface area would increase greatly, the value to wildlife would likely not increase proportionately because of the relative low value of bog shoreline. In addition the central island would be inundated.

LOSEMAN LAKE (Fig. W4)

Loseman Lake is a shallow boreal lake located entirely within the DND Air Weapons Range. A detailed wildlife survey has not been conducted with the exception of a preliminary reconnaisance flight over the lake in 1981. The lake appears to be only moderately productive for wildlife but perhaps important for beaver and otter.

The potential effects on wildlife of raising or lowering water levels is unknown. However, any attempt to stabilize the lake with a control structure on the outlet would affect the downstream winter flow rate. If winter flows were eliminated, the effect on beaver and otter on Wolf River would be detrimental to overwinter survival.

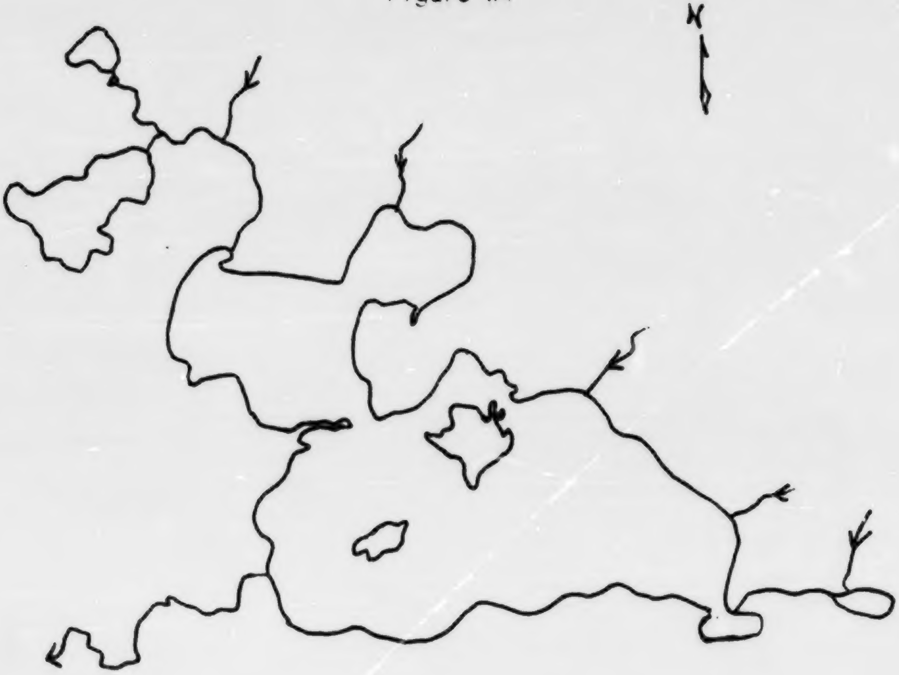
SINCLAIR LAKE (Fig. W5)

Sinclair Lake is a small isolated boreal lake for which there is no wildlife survey information. Evaluation from aerial photos indicate that productivity for waterfowl is relatively low. However, considerable use by beaver and otter is probable.

Potential effects of water level manipulation are not known. However, level manipulation involving an outlet control structure would affect downstream flows. Reduced winter flows in the creek connecting Sinclair and Wolf Lakes would be detrimental to beaver and otter.

LOSEMAN LAKE

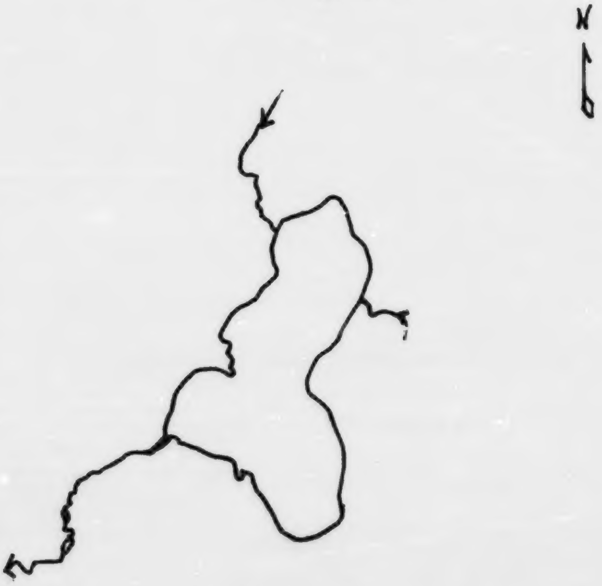
Figure W4



scale 1:50000

SINCLAIR LAKE

Figure W5



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Marie Creek Subwatershed (Fig. M1)

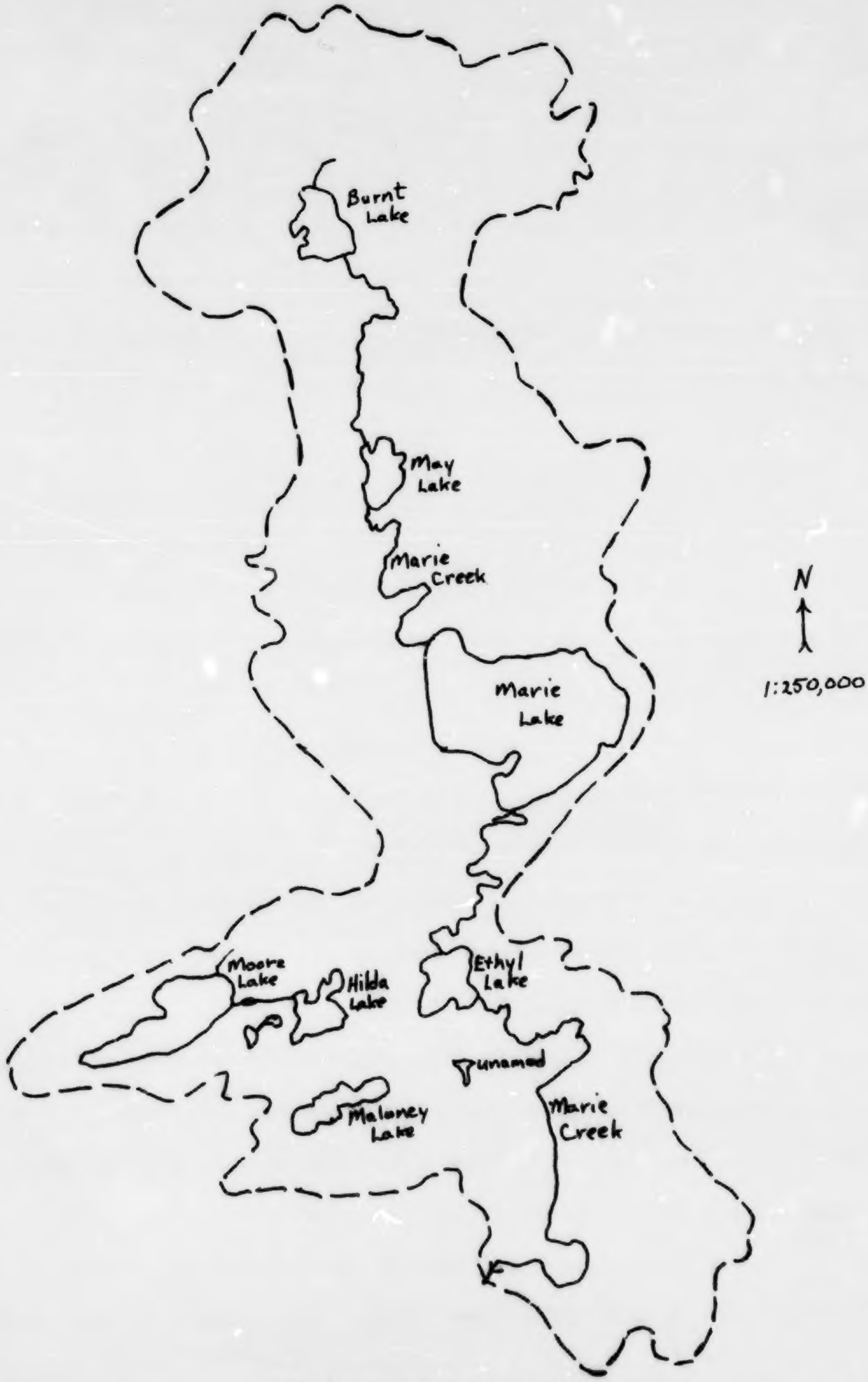
Except for the extreme south portion, the Marie Creek Subwatershed lies within the boreal mixed-wood ecotype. The northern half is characterized by relatively flat, poorly drained topography covered in a diverse mixture of cover types; uplands are dominated by white spruce, pine, balsam and aspen poplar while the extensive wetlands contain black spruce dominated muskeg. Streams in the area are low gradient and meandering.

Topography in the southern half is gently rolling, better drained, with much more upland. Aspen poplar becomes the dominant cover type with scattered stands of white spruce. Streams have slightly more gradient but still meander widely.

The relative stability of the water regime in the northern two thirds of Marie Creek Subwatershed coupled with the conifer dominated muskeg backshore cover provides somewhat less than optimum habitat for surface feeding waterfowl and muskrat. However, because of the relative remoteness of the area, some of the less common species such as bald eagle, osprey, river otter, foraging pelicans and mergansers still occur.

The greatest wildlife values in this area are in the form of semi-aquatic fur bearers. The low gradient meandering streams fed continuously by low flow rates (0.5 m/s - Searing, 1979) from extensive muskegs provide some of the most productive beaver and otter habitat in the province (Boyd, 1977).

Searing stated that beaver and muskrat constituted an average of 40% of the furs trapped in the Cold Lake area. His study of the abundance,


Burnt Lake
May Lake
Marie Creek
Marie Lake
N
1:250,000
Moore Lake
Hilda Lake
Ethyl Lake
unnamed
Maloney Lake
Marie Creek

Marie Creek Subwatershed

Figure M1

distribution and commercial value showed that beaver densities (lodges per linear km of streams or lake shore) in the area including Marie Creek subwatershed supported 2-3 times as many animals as areas studied elsewhere in the boreal forest (Tables M1 and M2 and Figure M1). This confirms Boyd's (1977) findings through trapping records and emphasizes the importance of beaver habitat and water regimes* presently existing in the subwatershed.

The southern one third of the subwatershed contains waterbodies with higher relative productivity for muskrat and a variety of waterfowl. Waterbodies have characteristics common to those in the aspen parkland. Agricultural activities have influenced their character somewhat by increasing eutrophication rates.

Muskrat trapping in the southern portion during 1970-75 averaged 1.3 animals/km^2. This catch-rate was second only to that of the Peace-Athabasca Delta (2.0/km^2 - Boyd, 1977).

Several authors have studied muskrat habitat requirements and the relevant facts are as follows (in Searing, 1977).

- muskrats can survive under a variety of water regimes but prefer stable levels.
- low water increases predation, decreases access to bank burrows, increases the risk of winter freeze-out.

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* 0.9-1.5 m in depth, sufficient water in winter to prevent freezing which protects against predators, maintains access to lodge opening, allows storage area for food and access to food. Large and/or rapid increases in depth or flow destroys dams, lodges and young beaver (from Searing, 1979).

Table M1

Table 6. Density Estimates for Beaver Lodges on Streams in Boreal and Other Northern Areas.

Searing 1979

Location	Density (Lodges/km)	Source
Cold Lake, Alberta	0.90	This Study
Ft. MacKay, Alberta	0.42	Penner 1976
Muskeg River, Alberta	0.40	Gilbert 1978
N.E. Alberta	0.32	Searing 1979
Porcupine Hills, Alberta	0.16	Sverre 1972
N.W. Alberta	0.50	Wooley 1974
Ft. Providence, N.W.T.	0.30	Fuller 1953
Ft. Smith, N.W.T.	0.20	Fuller 1953
Koyukuk River, Alaska	0.34	Libby 1954
Birch Creek, Alaska	0.35-0.46	Boyce 1974
Chena River, Alaska	0.36-0.48	Boyce 1974
S.E. New Brunswick	0.09-0.14	Nordstrom 1972
Minnesota	0.16	Longley and Moyle 1963

Table M2

Numbers and Densities of Beaver Lodges on Waterbodies in the Marie Creek Subwatershed, October 1978
(after Searing 1979)

Waterbody	Lodges		Approximate shoreline (km)	Active Lodges per km shoreline
	Active	Inactive		
Lakes:				
May	5	0	8.9	0.6
Marie	2	0	37.8	0.1
Ethyl	1	0	11.8	0.1
Hilda	8	3	14.6	0.5
Maloney	3	5	18.9	0.2
Total	19	8		1.5 ave. 0.3
Creeks:				
Marie Creek				
(May-Marie)	11	3	22.1	0.5
(Marie Ethyl)	17	7	11.9	1.4
Ethyl-Hilda	1	0	4.9	0.2
Hilda-Moore	1	1	2.8	0.4
Hilda-North	8	3	7.0	1.1
Marie-W	0	2	2.8	0.0
Marie-NE	10	4	7.0	1.4
Marie-NC	3	1	2.0	1.5
Marie NW	11	7	13.5	0.8
May NE	1	0	3.5	0.3
May NC	5	1	3.6	1.4
May NW	3	5	2.6	1.2
Total	91	34	83.7	10.2 ave 0.9

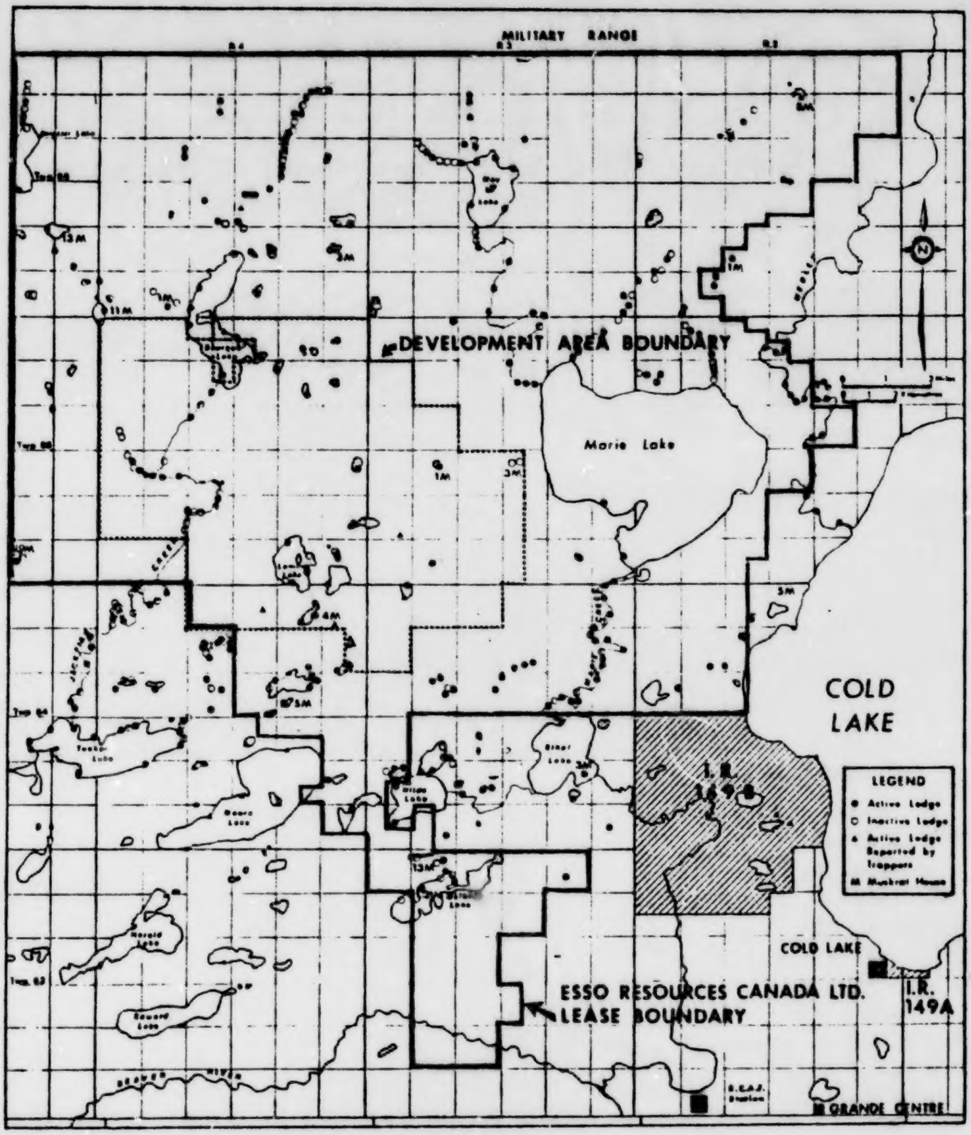

MILITARY RANGE
R4
R3
R2
DEVELOPMENT AREA BOUNDARY
Marie Lake
COLD LAKE
LEGEND
● Active Lodge
○ Inactive Lodge
▲ Active Lodge Reported by Trappers
M Muskrat House
I.R. 149 B
COLD LAKE
I.R. 149A
ESSO RESOURCES CANADA LTD. LEASE BOUNDARY
GRANDE CENTRE
BEAVER RIVER

Figure M2

Figure 2. Locations of Beaver Lodges and Muskrat Houses Observed on and near the Esso Lease, Cold Lake, Alberta, on 24 October 1978 or Reported by Trappers during the 1978-1979 Trapping Season.

Searing 1979

- high water increases mortaility to drowning, flooded nest sites and destruction of shelters.
- high water may limit or kill emergent food sources.

The stable marsh areas within and associated with lakes and streams in the southern portion of Marie Creek subwatershed presently meet habitat requirements of muskrat and provide the local inhabitants with an important supplemental source of income.

Burnt Lake (Figure M3)

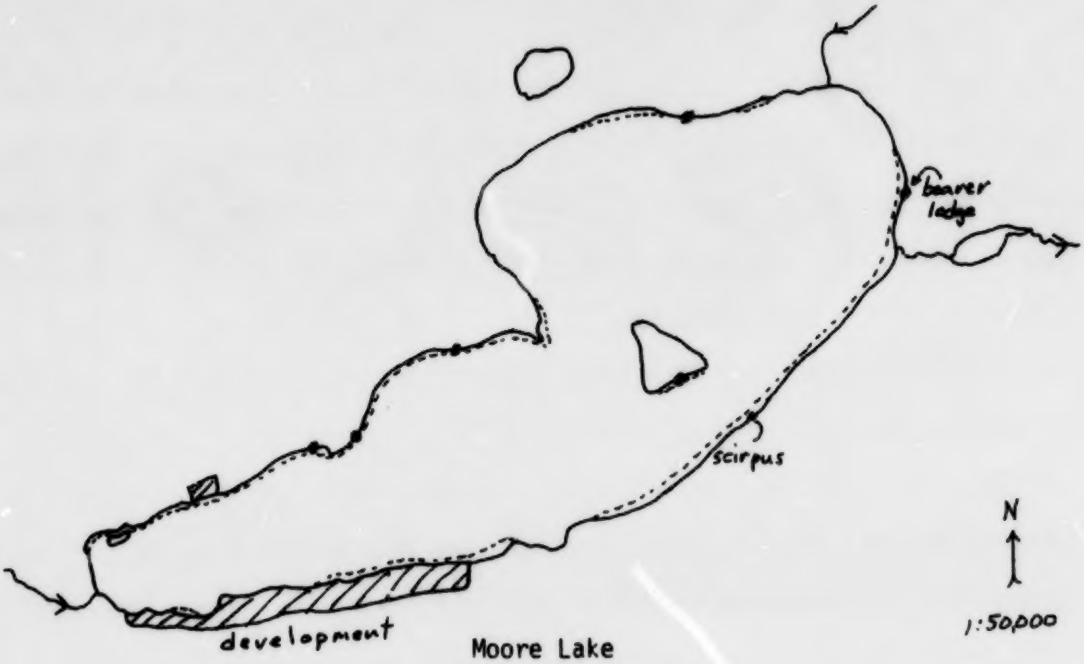
Burnt Lake is a small, shallow boreal lake located entirely within the DND Air Weapons Range. No quantitative wildlife studies have been conducted on the lake. Airphotos and a preliminary check by aircraft indicates it is probably marginal for waterfowl production although beaver, otter and mink likely make extensive use of the area.

McGregor (1981) indicates that increases to 1 m in water level would flood substantial areas creating shallow wetland on the north shore. This may enhance waterfowl productivity but likely not significantly because of the relative low general productivity of the surrounding area.

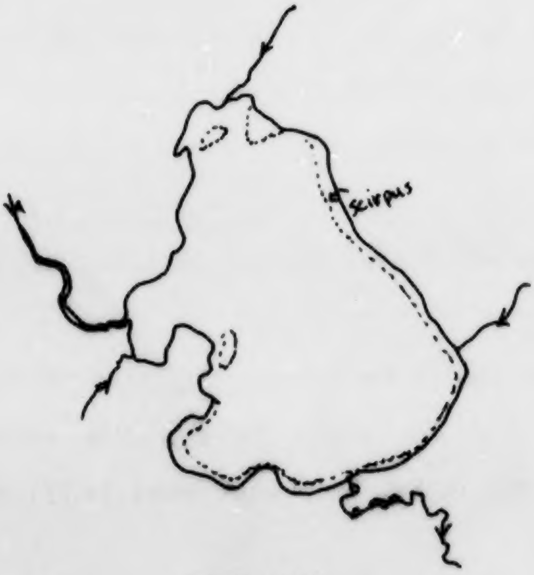
Decreases in level would likely decrease potential waterfowl productivity by decreasing the extent of emergents.

The greatest effect of manipulating levels on existing wildlife in this area would however be upon beaver, otter and mink because of resulting changes in downstream flow regimes. As mentioned above the slow (0.5 m/s) but steady flow rates provide ideal conditions for these valuable fur bearers, especially during winter.

It is recommended therefore that the mean water level in Burnt Lake could be increased by as much as 0.5 m but flow rates and timing downstream must be maintained at present levels.


beaver lodge
scirpus
development
N
1:50,000

Moore Lake
Figure M8



Burnt Lake
Figure M3

May Lake (Figure M4)

May Lake is a small, stable, remote, boreal lake with extensive emergent beds of scirpus and pond lily along the north and south shorelines. Waterfowl productivity is relatively low (Index 6.24) with major species being goldeneye, common loon, coot, red-necked grebe and lesser scaup. No quantitative surveys were conducted.

As with Burnt Lake, the associated small waterbodies and streams are very productive for beaver, otter and mink.

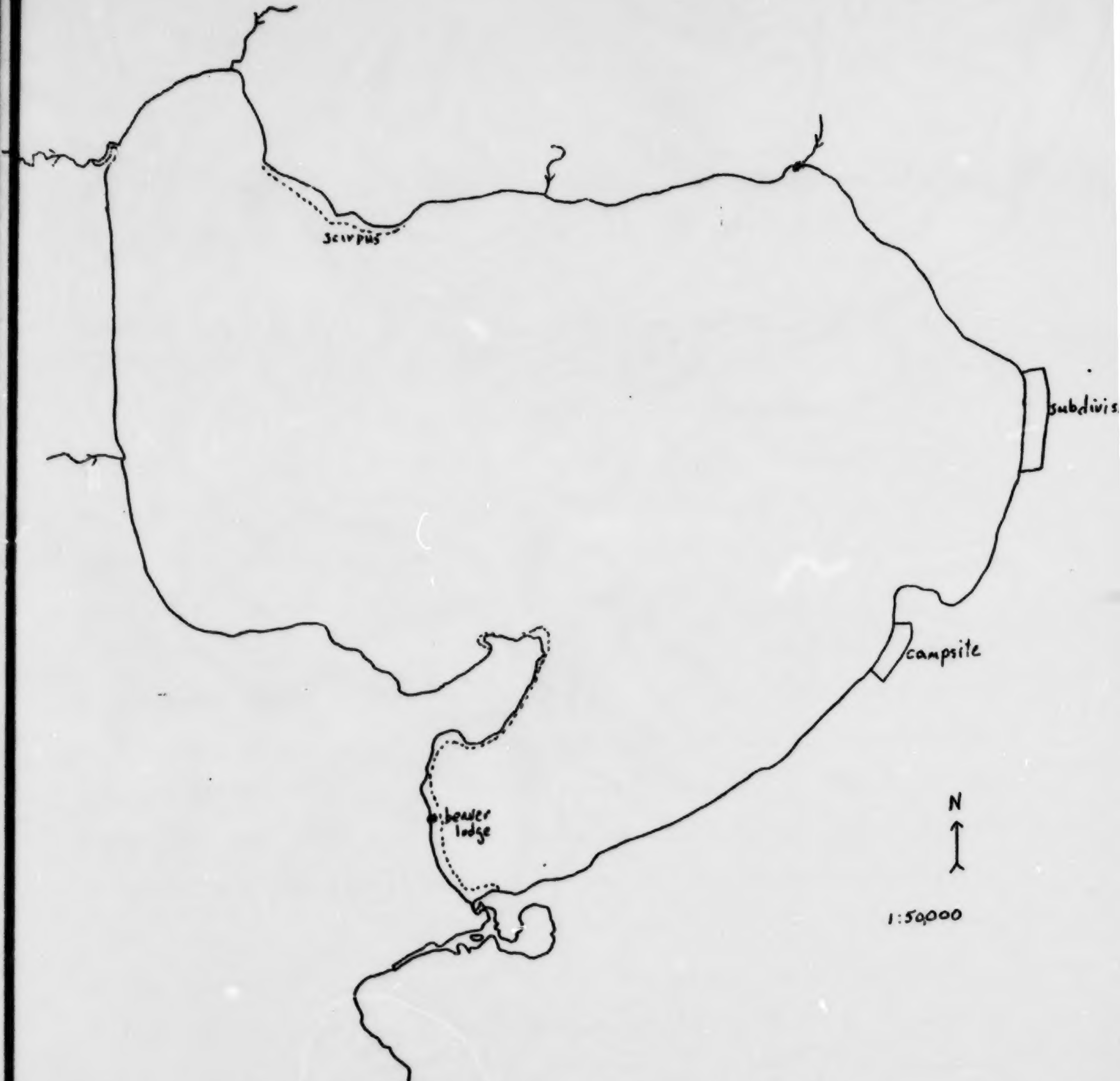
Because May Lake is depressional, deriving most of its inflow from surrounding muskeg, its level has remained very stable. In addition, because of topography it would be difficult or impossible to change the level significantly. Slight increases in level would flood surrounding areas but waterfowl productivity would likely not increase significantly because of the general low productivity of the flooded area.

Any effort to manipulate levels in May Lake would have the same consequences to beaver downstream as in Burnt Lake.

It is recommended therefore that no change be contemplated for May Lake.

Marie Lake (including associated waterbody in 1-65-3-W4) (Figure M5)

Marie Lake is unique in the subwatershed (and in the BRWRS area) in that it is mesotrophic. It has almost no shoreline suitable for habitat of semi-aquatic wildlife. It has the lowest index (4.22) of all lakes surveyed.


scirpus
subdivis
campsite
beaver lodge
N
1:50000

Marie Lake
Figure M5

The only species considered common on the lake are California gull (not nesting), red breasted merganser, mallard, wigeon, loon, none of which are abundant.

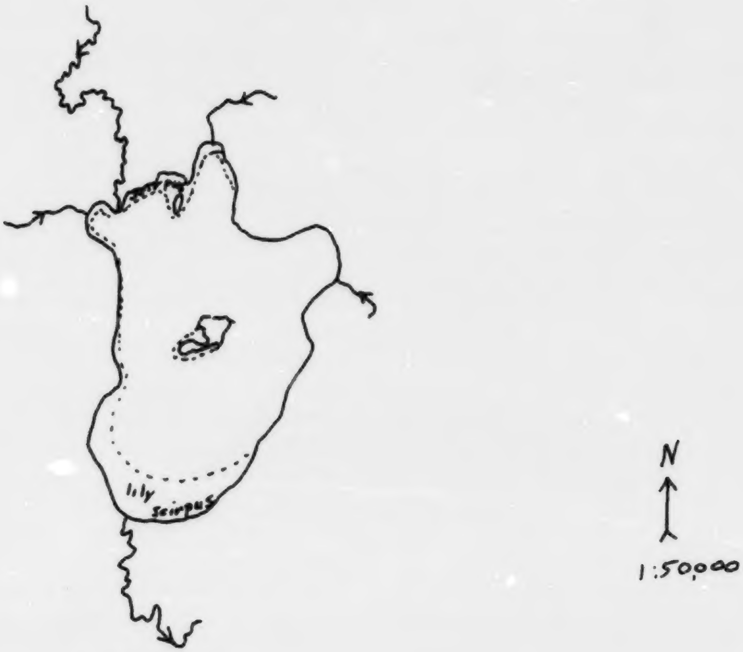
Rarer species include white pelican (foraging only) and osprey-nesting some distance from the lake.

Beaver are abundant on the inlet and outlet streams only (Table M2).

Water fluctuations in excess of one meter will have negligable effects on wildlife using the lake but because downstream flow rates could change, an effect on beaver and otter could be realized. Very slow but continuous winter flow rates in the low gradient outlet are necessary for beaver in Marie Creek (see Burnt Lake).

Any control structure on Marie Lake would likely be placed upstream from the unnamed associated waterbody in 1-65-3-W4. The latter is shallow with emergent growth around the perimeter, however productivity is low probably because of the low temperature of water flowing from Marie Lake. A control structure may increase the use of this waterbody by reducing flow through in early summer.

Therefore water storage in excess of present levels would not be detrimental to existing wildlife however present downstream flowrates must be guaranteed.


lily
scirpus
N
1:50,000

May Lake
Figure M4

open
grass-carex
outlet ditch
DU control
Structure
1975 level
1981 level

Maloney Lake
Figure M9

Ethyl Lake (Figure M6)

Ethyl Lake is a relatively small eutrophic lake located at the southern edge of the boreal mixed-wood ecotype. Most of the shoreline is only moderately productive for waterfowl (Index 6.99) with the exception of the southeast bay area and associated points. Major waterfowl species include mallard, wigeon, lesser scaup, rednecked grebe and coot.

Although the bottom contour of Ethyl Lake varies greatly and gives good diversity to aquatic habitats, the phreatic zone which supports surface wildlife is fairly limited and subject to significant change by relatively small level fluctuations.

A drop of 1 m below present mean level would partition off the southeast bay which would eliminate the outlet. This would probably not occur but would reduce the use of the bay by wildlife and would be detrimental to the existing colony of western grebes.

A level increase of 0.5 m would reduce the extent of emergent beds, reduce the length of existing points and expose overwater nesters such as western grebe to increased wave action. Increased ice scour would reduce carryover of nesting material important to these species (see Wolf Lake).

Existing wildlife productivity on Ethyl Lake can be maintained if maximum May-July levels do not exceed 541.0 m.

Hilda Lake (Figure M7)

Hilda Lake lies on the transition zone between boreal mixed wood and aspen parkland. It is relatively small and eutrophic with a very diverse shoreline. Emergent and backshore vegetation diversity result in a variety of habitat types. Waterfowl and water associated wildlife are consequently diverse and abundant (Index 11.23) with the main species being mallard, wigeon, rednecked grebe, bufflehead and goldeneye. The lake is important also as a post-breeding molting area for whitewinged scoter and canvasback.

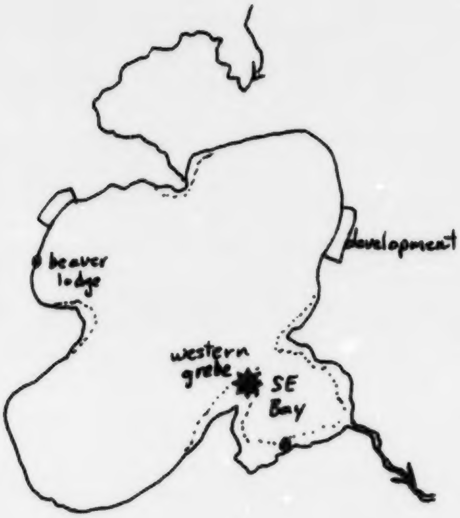
The two bays on the north support populations of muskrat while beaver occur in good numbers throughout the lake (9 active lodges, 1981).

One active osprey nest occurs on the north shore.

Hilda Lake is relatively shallow with much of the most productive wildlife areas (bays and points) being 2 mean depth. Increases in mean depth of 0.5 m would be the maximum tolerable to present productivity because of decrease diversity, i.e. flooded trees and less extensive emergent stands. Decreases in mean of greater than 0.5 m would partition off the N.W. bay decreasing its use by many species including osprey and beaver. It is also important to beaver that existing downstream flows be maintained (Table M2).

Moore Lake (Figure M8)

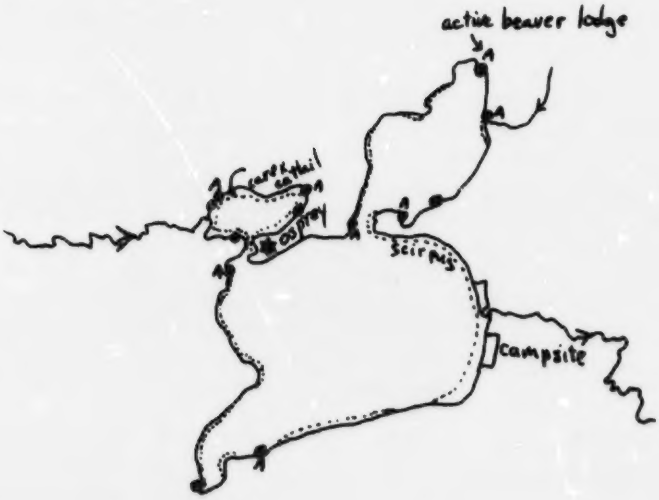
Moore Lake has a sandy, regular shoreline. There is little diversity in emergent and shoreline vegetation with a scirpus fringe and backshore of


beaver lodge
development
western grebe
SE Bay

Ethyl Lake
Figure M6

N

1:50,000


active beaver lodge
carex/cattail
osprey
Scirpus
campsite

Hilda Lake
Figure M7

poplar mixed in some areas with white spruce and pine. The value to waterfowl is limited (index 5.73) with red necked grebe, bufflehead, wigeon and lesser scaup being the most common species. There are six beaver lodges on the lake.

The central island has historically been used by nesting blue herons but presently supports a bald eagle pair. Western grebes are present but no colony has been located. Osprey and white pelican forage on the lake.

Increases in mean level in excess of 0.5 m would likely cause severe shoreline erosion because of the sandy soil. Similar decreases in mean would likely result in slightly more extensive scirpus development but would not likely increase wildlife productivity significantly because of the lack of diversity in shoreline cover types.

The value of this lake from an aesthetic and recreational standpoint would outweigh proposals to significantly increase or decrease the level.

It is important to beaver to maintain existing downstream flow regimes (Table 2M).

Maloney Lake (Figure M9)

Maloney Lake is located in the northern aspen parkland and has been significantly influenced by agriculture, i.e. grazing and hay production in the open area around the shoreline. It has undergone extreme fluctuation in level over the past 30 years but was subject to a level control project funded partly by Ducks Unlimited. A ditch was constructed to Marie Creek and a control structure placed near the lake. Landowner dissatisfaction has, however, resulted in modifications to the level and presently the lake is very low, consisting of a number of small sloughs.

Historically the marshy nature, diverse shoreline and cover types provided excellent habitat for muskrat and waterfowl (the trapper for the area including Malony Lake report 400-500 muskrats annually with a value of near $2500 during 1970-75). However, present low waterlevels have resulted in excessive plant growth and poor winter water conditions for muskrat decreasing its productivity considerably (Index 7.87).

Ideally, a level of 0.5 to 1 m above the 1981 level would significantly increase the value to waterfowl and muskrat. This would result in the lake being one of the most productive in the Beaver River basin.

Unnamed Lake - N35-63-3-W4 (Figure M10)

This small waterbody contains excellent nesting habitat for a variety of waterfowl (index 19.29) which has resulted from periodic fluctuations in level, probably of 1 m. Maintenance of suitable habitat is dependent upon these periodic fluctuations which prevents the establishment of solid emergent beds.

COLD RIVER SUB WATERSHED (Figure C1)

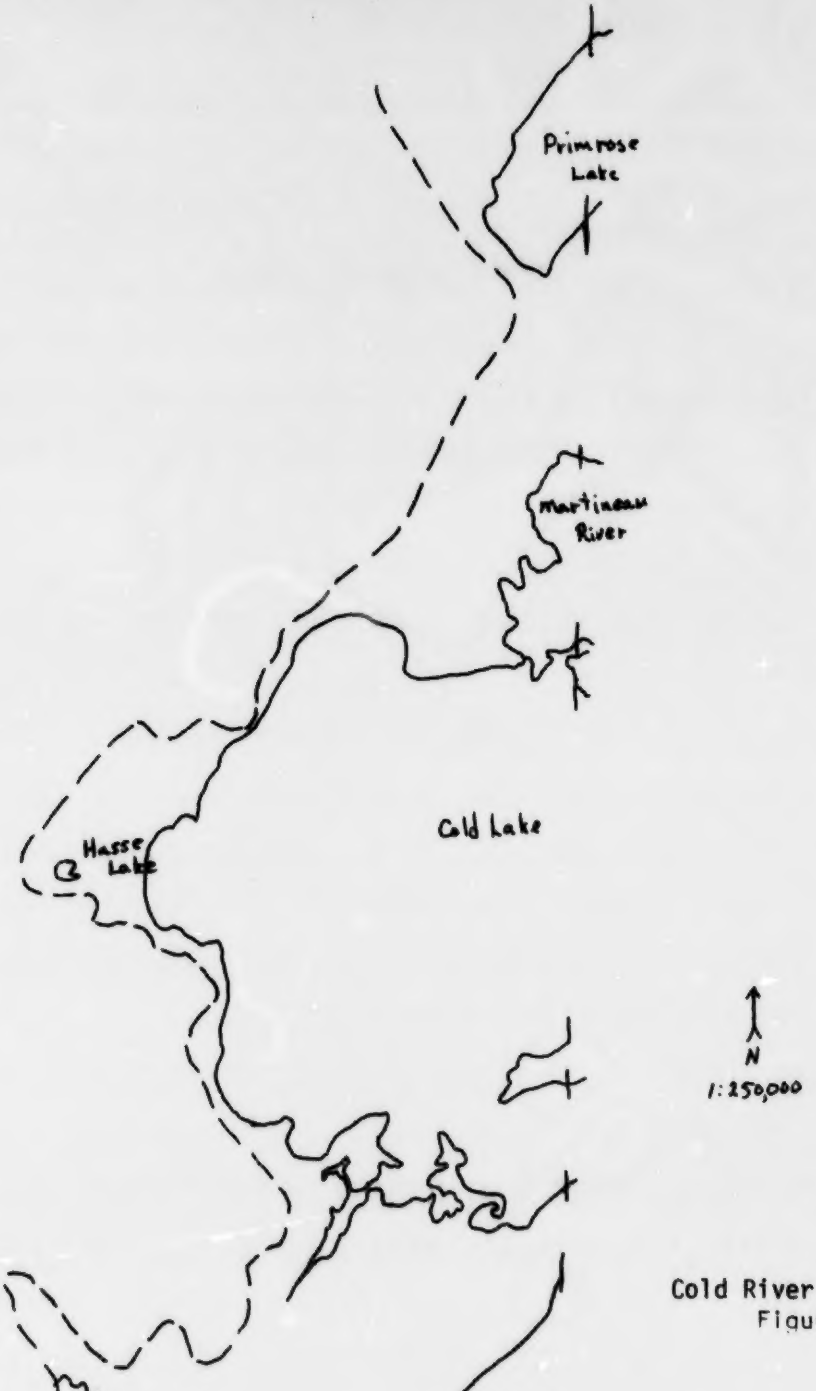
The following deals only with the small portion of Cold River Subwatershed which lies within Alberta. The northern two thirds of the area contains extensive black spruce-spagnum muskeg with mixed white spruce-poplar upland. General wildlife productivity is relatively low with the exception of beaver which make use of riparian cover types along the numerous low gradient meandering streams.

Toward the southern portion of the subwatershed landform becomes more diverse incorporating areas of steep topography and containing portions of two large lakes - Primrose and Cold Lakes. Wildlife habitat diversity and productivity also increases including species associated with large waterbodies such as merganser, white pelican, bald eagle, osprey and western grebe along with a variety of more common waterfowl.

Agriculture in the form of cropland and improved grazing as well as recreational and urban development (beaches, towns, cottaging, parks) have influenced the natural habitat to some degree in the Cold Lake area. Military weapon testing have resulted in local habitat changes at Primrose Lake.

Cold Lake

Cold Lake is a large, deep, oligotrophic lake and consequently the main lake body is relatively low in wildlife productivity. This is largely because most of the shoreline is exposed to intensive wave action and ice scour


Primrose Lake
Martineau River
Cold Lake
Hasse Lake
N
1:250,000

Cold River Subwatershed
Figure C1

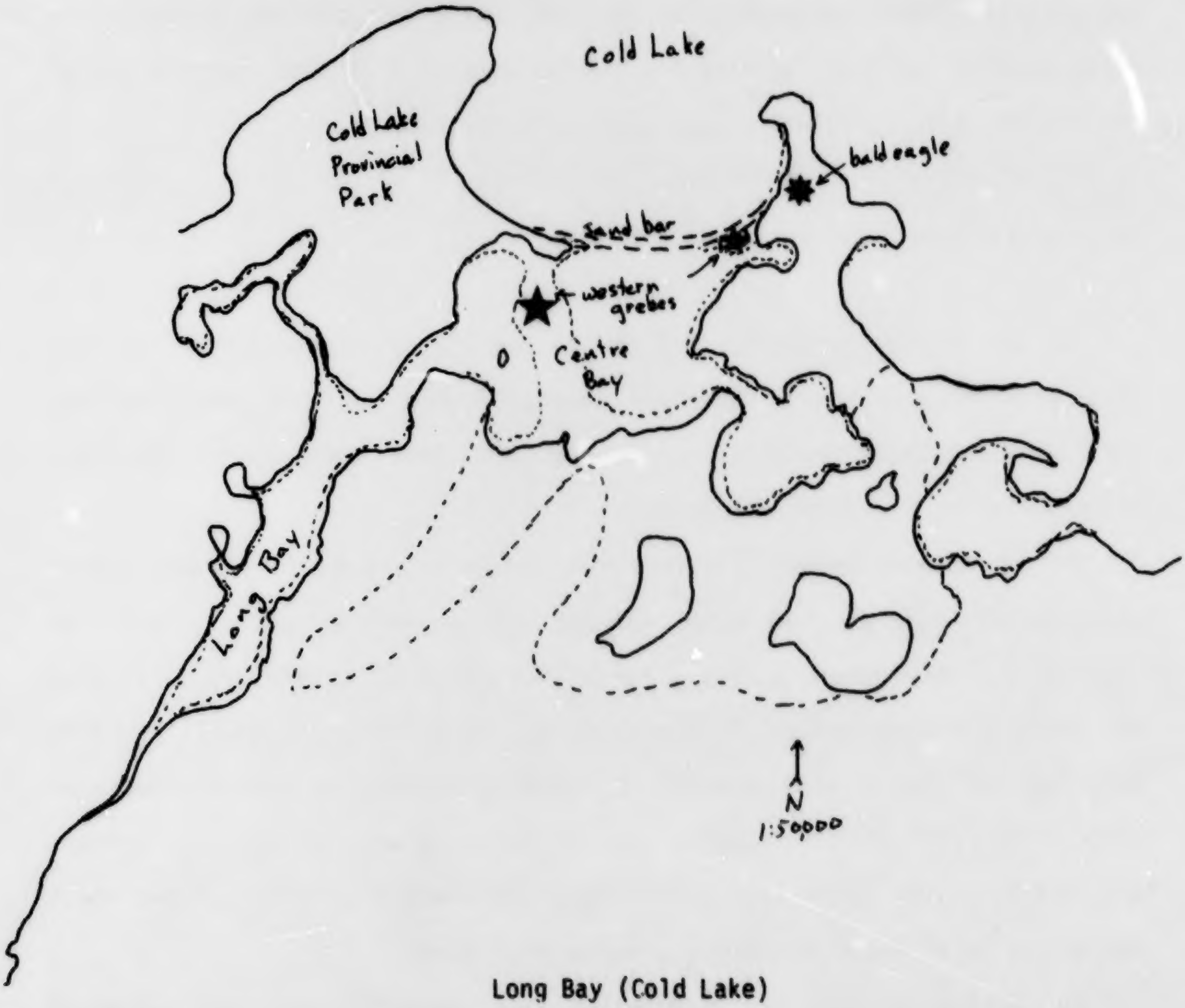
eliminating the development of suitable emergent vegetation. In addition the great depth and consequent water volume prevents early spring warming necessary for many wildlife species. However because of relative shallowness and physical protection from waves and ice, the areas near and including the mouth of Martineau River and the bay complex east of Cold Lake townsite are of significant value to wildlife associated with the lake.

Long Bay and Associated Wetlands (Figure C2)

The bay complex including Long Bay is physically separated from the main lake body by a slightly submerged sandbar. This relative isolation and shallow water depth results in much of the area having very different characteristics than Cold Lake proper.

The bay complex becomes ice free much before Cold Lake (Gunderson. 1981). Consequently, the earlier water warming allows earlier plant growth and invertebrate development giving a marsh-like character to the area. Diverse emergents including cattail, carex, scirpus, phragmites and pond lily form good habitat for a wide variety of water associated wildlife. The most notable feature of the complex is a large colony of western grebes. Approximately 1000 pairs nest in two separate areas. This constitutes about 15% of the total known in Alberta breeding population.

The ecology of the bay complex is very dependent upon the degree of physical separation from Cold Lake. If the lake level decreases 1m below histroic mean the bay would become completely isolated because of sandbar


Cold Lake
Cold Lake Provincial Park
bald eagle
sand bar
western grebes
0
Centre Bay
Long Bay
N
1:50,000

Long Bay (Cold Lake)
Figure C2

exposure. Western grebes use the main lake for escape cover and for brooding young. They cannot travel overland and must have a water connection to the bay. In addition a one meter decrease would significantly reduce the phreatic zone in the bay and associated wetlands (McGregor, 1981).

A significant increase in level (to 1m) would expose the bay to wind and ice action, probably moving the sand bar into the bay. This would eliminate many emergents, especially those required for nesting by western grebes (also see Wolf Lake).

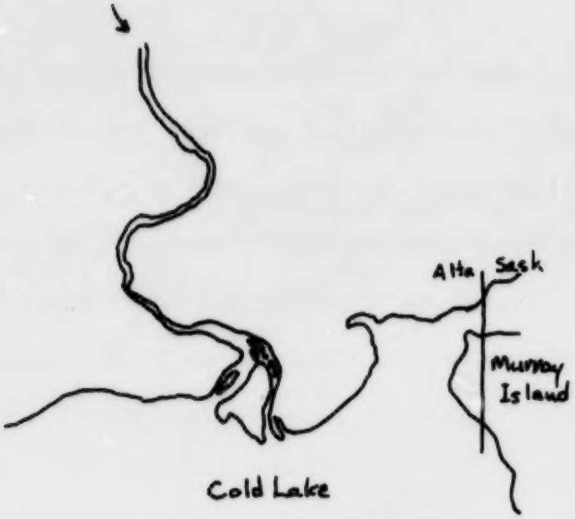
Martineau River Mouth (Figure C3)

Relative shallow water depth, a complex shoreline and protection from waves and ice provided by Murray Island combine to give the Martineau River mouth area characteristics much more condusive to wildlife than the main lake. Beaver, muskrat, waterfowl, and water associated birds are well represented but no quantitative surveys have been conducted.

Increase water depths in Cold Lake (1m) would have the effect of exposing the area to greater wave and ice action decreasing emergent development. Decreases of 1m would eliminate the phreatic zone associated with the shallow bays.

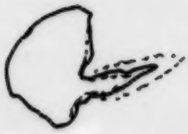
Primrose Lake (Figure C4)

The large majority of Primrose Lake lies in Saskatchewan totally within the DND air weapons range. The Alberta portion is relatively deep and the

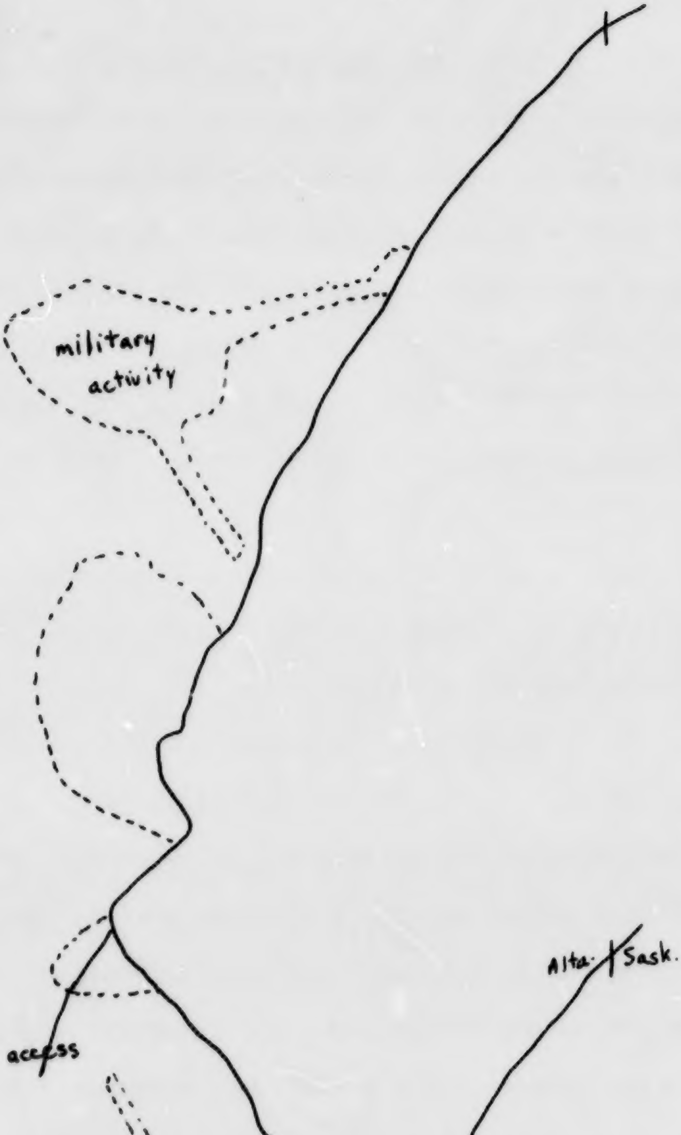

Alta
Sask
Murray Island
Cold Lake

Martineau River Mouth
Figure C3

1:50,000



Hasse Lake
Figure C5


military activity
access
Alta.
Sask.

Primose Lake
Figure C4

regular shoreline is subject to considerable wave and ice action. Consequently wildlife productivity is low. However, Primrose Lake is unique in that the southwest arm has charcteristics of a large boreal lake while the main body (in Saskatchewan) is very shallow with a diverse shoreline, many islands, abundant submergent beds and extensive emergent beds of scirpus.

The lake contains the fourth largest white pelican colony (2500 pairs) in the world. Associated with the colony, on the same island, are blue herons, common terns, ring-billed and California gulls, double crested cormorants and a variety of waterfowl.

The lake also contains a large colony of western grebes (location unknown) and extensive populations of beaver, muskrat, river otter and mink (no quantitative studies have been conducted).

Wildlife habitat on Primrose Lake is associated with low islands and low-slope shorelines. As such, water level fluctuations have a high potential to cause significant changes in productivity. Increases of 1m would significantly reduce the extent of the productive area by exposing it to flooding and increased wave and ice action. Decreases of 1m would significantly change the extent of emergents and submergent vegetation which would effect the forage species distribution and abundance (the extent is unknown).

Hasse Lake (Little Bear Lake) (Figure C5)

Hasse Lake is a very small boreal waterbody surrounded by mix-wood forest, currently used as a put-and-take rainbow trout fishery. Wildlife productivity is very low (Index 7.74). Level changes have little consequence to wildlife.

MANATOKAN CREEK SUBWATERSHED (Figure M1)

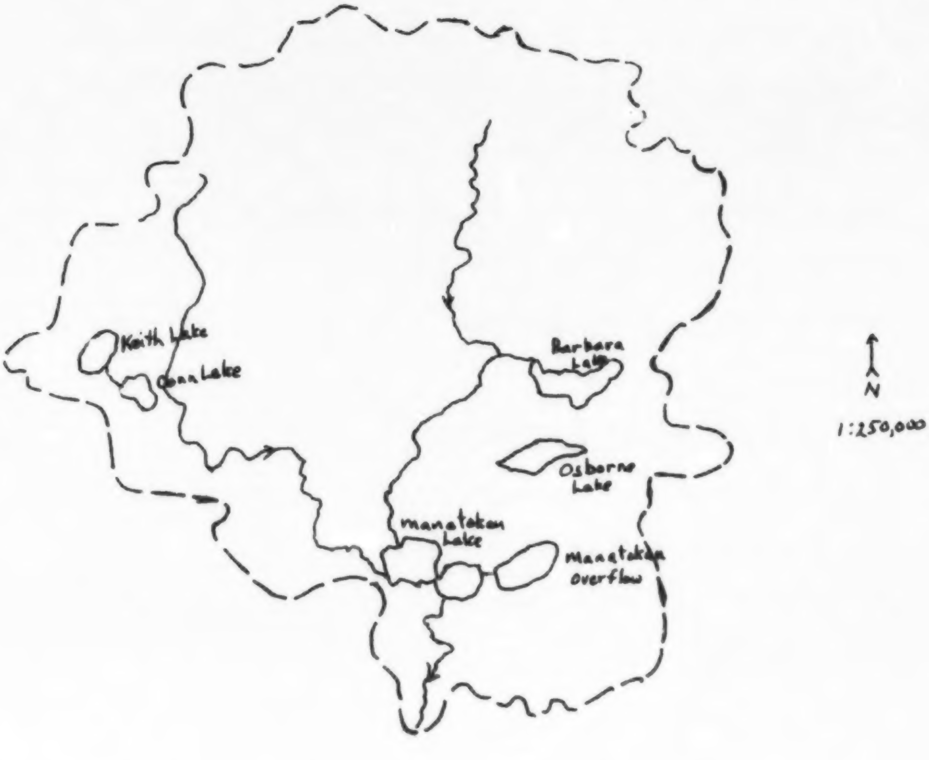
Manatokan Creek drains an area of gently rolling topography covered in aspen dominated mixed-wood forest which is undergoing rapid agricultural development. Much of the forest cover in the southern half has now been removed for forage and cropland. The streams are low gradient and meandering while the small waterbodies are shallow and eutrophic with marsh-like characteristics. The northern half of the subwatershed is still mainly forested containing some muskeg and white spruce stands.

Important water related wildlife include waterfowl, muskrat and beaver with some of the small waterbodies being extremely productive for waterfowl which feed on local cropland. A "bait station" was established near Manatokan Lake to reduce the depredation problem.

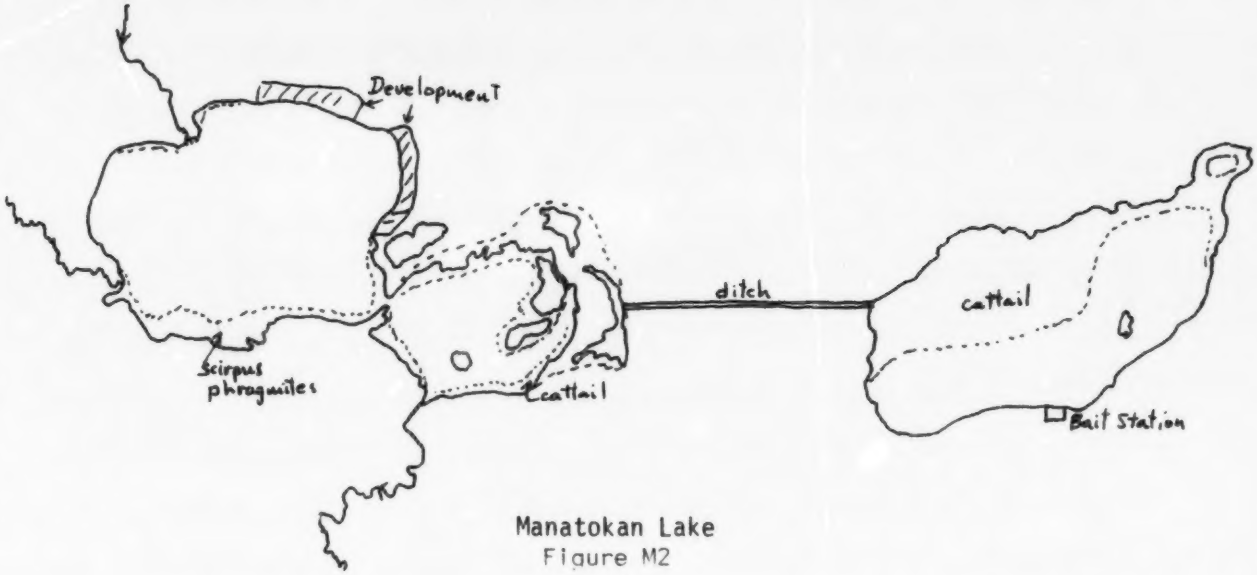
Fur values to local resident trappers, although not available, form an important supplementary source of income.

Manatokan Lake (Figure M2)

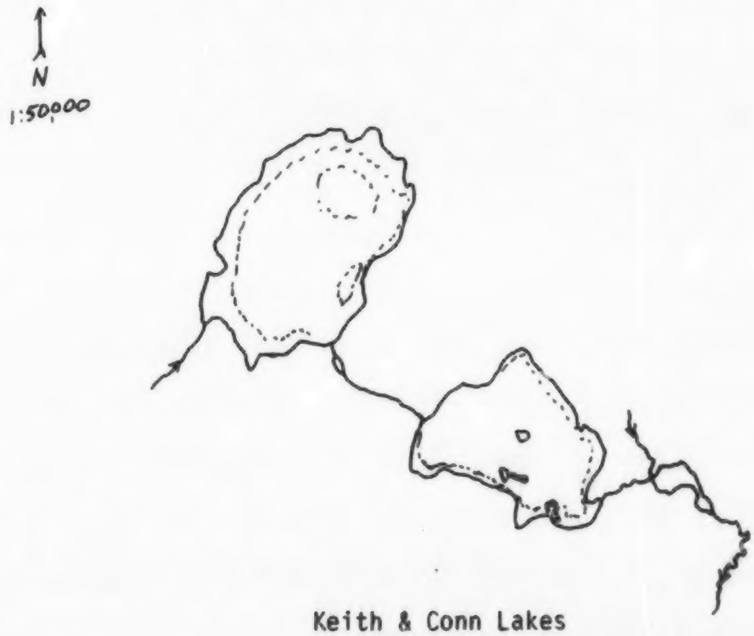
Manatokan is a small eutrophic lake essentially partitioned into two sections. The western section, the only fish-bearing body in the subwatershed, has a dish shaped contour with extensive areas of emergent growth especially on the south and west shores. The eastern section of the lake is very shallow (1m) and contains very extensive masses of cattail and submergent vegetation.


Keith Lake
Conn Lake
Barbara Lake
Osborne Lake
Manatokan Lake
Manatokan Overflow
N
1:250,000

Manatokan Creek
Subwatershed
Figure M1


Development
Development
ditch
cattail
Scirpus
phragmites
cattail
Bait Station

Manatokan Lake
Figure M2



Keith & Conn Lakes
Figure M5

Waterfowl diversity and abundance is exceptional including representatives of most waterfowl found in NE Alberta (Index 11.88). In addition the bay is used by several pairs of nesting Canada geese. A recent project to enhance nesting in the lake by providing alternate sites for Canada geese was conducted by Fish and Wildlife Division staff. Muskrats are trapped by resident trappers. Although no records are available, the take is thought to be relatively high.

Because of the very shallow sloped shoreline and minimal depth over much of the lake, water level fluctuations would have profound effects on wildlife habitat. The level of Manatokan Lake has largely been controlled at about the present level by a beaver dam on the outlet. However, Ducks Unlimited has recently begun a project to stabilize the level with a sheet metal dam. The level established by mutual agreement among landowners, Fish and Wildlife Division, Ducks Unlimited and the M.D. of Bonnyville is 555.5.

Manatokan Lake Overflow (19-63-6-W4) (Figure M2)

This small waterbody has had a tenuous existance over the past few years. It has been completely dry at times. At full capacity it does not exceed 2m in depth. A drainage ditch was constructed many years ago westward to Manatokan Lake which controlled the upper limit. At present the lake is being incorporated in the Ducks Unlimited plan for Manatokan Lake whereby the existing ditch will be deepened and widened. A control structure in the ditch will be used to charge the lake with spring run-off from Manatokan or can be used to reduce levels if the run-off is excessive.

The lake presently provides among the best waterfowl and muskrat habitat available in the Beaver River basin (Index 15.06). Several pairs of Canada geese nest on floating cattail beds and the south shore is used as a feeding site to control waterfowl depredation on surrounding agricultural crops.

Slight fluctuations in level have profound effects on the size and productivity of the lake. The level of 555.5 has been agreed upon as an optimum for waterfowl and muskrat production. Ducks Unlimited plans also include enhancement by island building and level ditching.

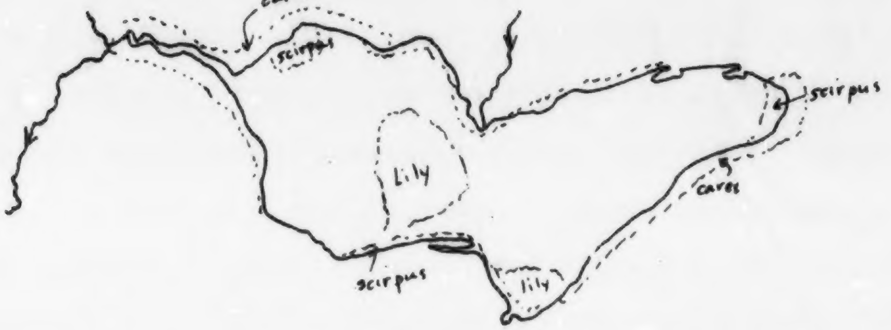
Barbara Lake (Figure M3)

Barbara Lake is a small shallow waterbody with very extensive beds of pond lily. The level is presently controlled partially by beaver activity downstream. The lake is moderately productive for waterfowl and muskrat (Index 13.44) and contains 2 - 3 nesting pairs of Canada geese.

A slight decrease in water level would likely expose more areas which produce emergents and nesting cover.

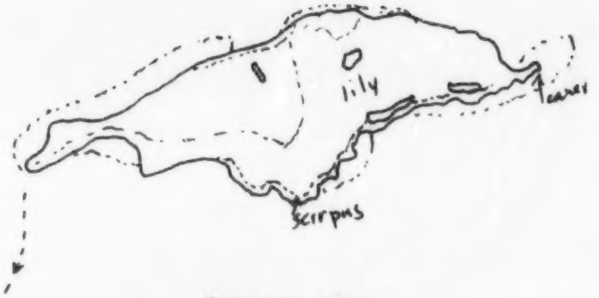
Osborne Lake (Figure M4)

Osborne Lake is a small waterbody with a variable bottom contour. The outlet has essentially been eliminated by agricultural activities and consequently much of the shoreline vegetation consists of flooded trees. A number of islands have also been flooded in the past few years significantly


carex
scirpus
scirpus
lily
carex
scirpus
lily

Barbara Lake
Figure M3

N
1:50000


lily
carex
scirpus

Osborne Lake
Figure M4

reducing the lake's potential for waterfowl (Index 12.54). A reduction of 1m would greatly improve productivity.

Keith and Conn Lakes (Figure M5)

These two lakes are very shallow, largely surrounded by mixed forest and have extensive margins of scirpus, cattail and carex. They are moderately productive for muskrat and waterfowl with Canada geese being a common nester (Index 6.28). Present levels appear to be sufficient for existing wildlife.

Streams

Both Osborne and Manatokan Creeks contain numerous beaver dams which control the intermittent flow.

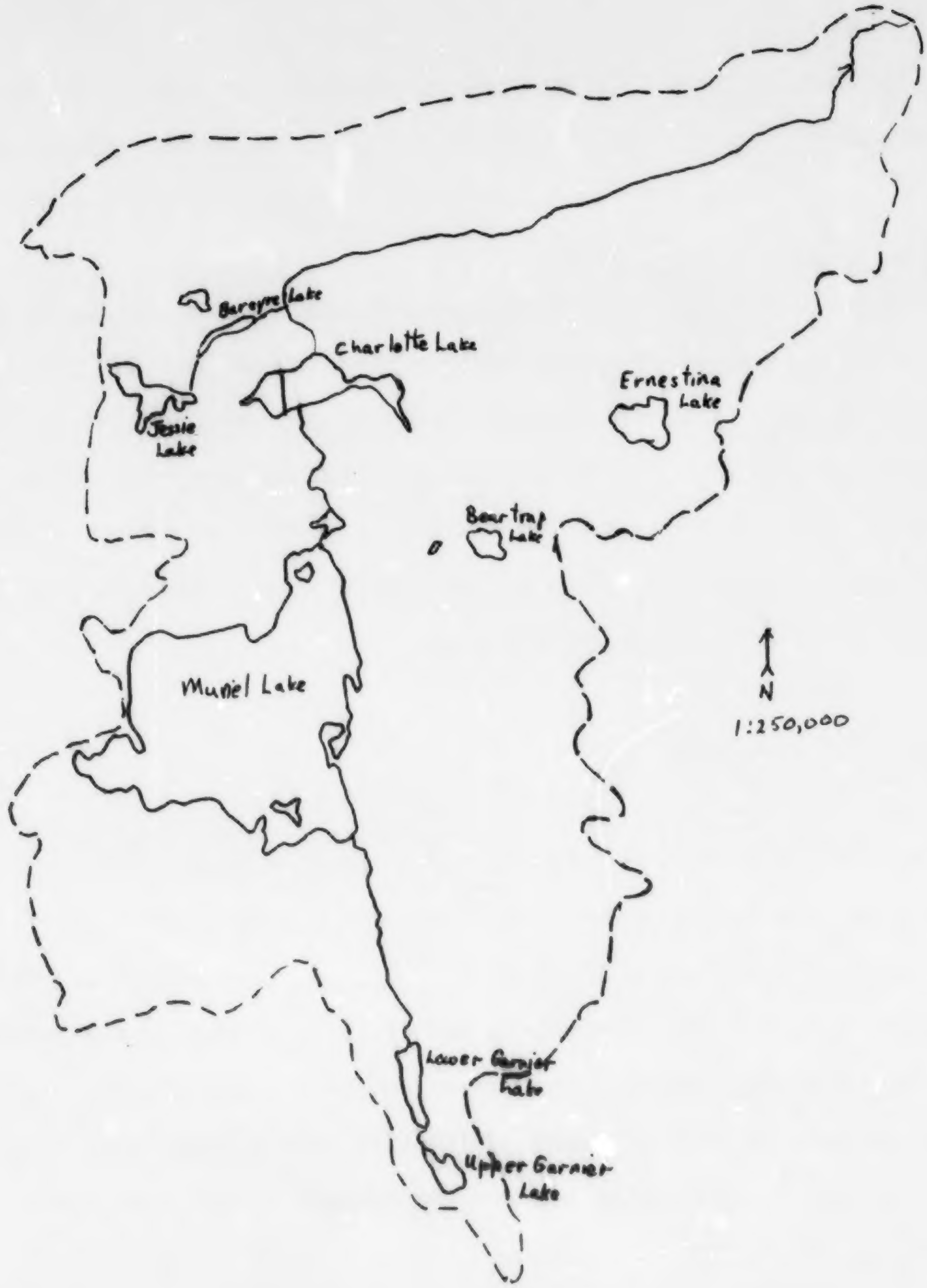
MURIEL CREEK SUBWATERSHED (Figure Mu1)

The Muriel Creek Subwatershed encompasses an area that varies from strongly rolling, forested (mixed-wood-aspen dominated) topography in the south to relatively flat land extensively influenced by agricultural cropland in the north.

Water related wildlife resources include (a) an extremely productive waterfowl and muskrat area associated with developed farmland and (b) a good fur production area for beaver, muskrat and mink ($6500.00 earned by registered trappers in 1980-81) in the southern forested area. Resident trappers also operate in the agricultural area with an average of 200 permits sold annually at Bonnyville over the last 5 years. Waterfowl hunting is a popular activity in the Bonnyville area.

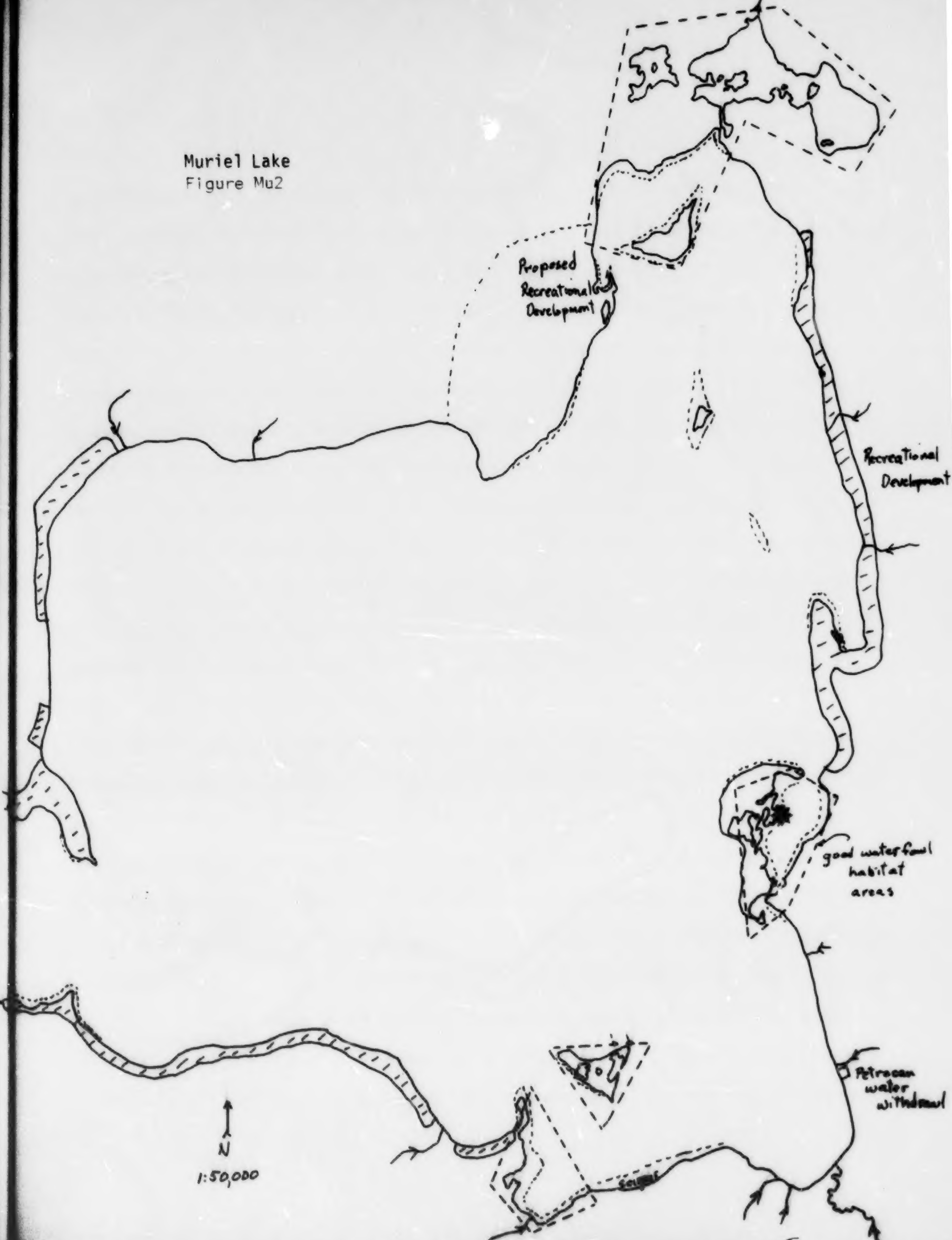
Muriel Lake (Figure Mu2)

Muriel Lake is a relatively large shallow lake surrounded by aspen dominated forest which has been influenced considerably by recreational development in the form of campsites, beaches, and cottaging. The lake is somewhat unique in that most of its bed consists of sand or rock which results in low nutrient load and consequent minimal summer algal blooms. This combined with the fact that much of the shoreline is subject to intensive wave and ice action, decreasing emergent development, gives the lake a very high potential for recreation.


Bareyre Lake
Charlotte Lake
Jessie Lake
Ernestina Lake
Beartrap Lake
Muriel Lake
N
1:250,000
Lower Garnier Lake
Upper Garnier Lake

Muriel Lake Subwatershed
Figure Mu1

Muriel Lake
Figure Mu2


Proposed
Recreational
Development
Recreational
Development
good waterfowl
habitat
areas
Petrocan
water
withdrawl
N
1:50,000

Water related wildlife, one of the attractive features to recreationists from an aethetic sense, are generally associated with the shallows near islands and in protected bays. In these areas waterfowl are relatively diverse and abundant giving the lake an overall index of 11.86. Common species include mallard, wigeon, lesser scaup, blue winged teal and rednecked grebe. Also present in good numbers and of more aesthetic appeal are California and Franklin gulls, common and black terns, common loons, western grebe and white pelican (foraging only). The western grebes nest in a colony (300-400 birds) in the east shore bay. There is historical record of blue heron and osprey nesting on the lake as well as a large gull colony on the southeast island.

Water levels on Muriel Lake have fluctuated about ± 0.5 m in the past with minimal effects on wildlife habitat. However deceases beyond 0.2 m from historical mean would serious decrease emergent zones, decrease access and suitability of nesting sites for western grebes in the east bay. (See Wolf Lake) reduce emergent zone in Landry Lake, the northeast and the southwest bays consequently decreasing wildlife productivity and use of the area. An increase of 0.2 m would be the maximum allowable to protect existing habitat areas from adverse effects of increased wave and ice action.

Beartrap Lake (Figure Mu3)

Beartrap Lake is a small, round lake with a max depth of 12 m surrounded by mixed wood forest. About 1/2 of the fairly regular shoreline is exposed to considerable ice and wave action eliminating the emergent zone. The lack of diversity on the remaining shoreline, with the exception of the NE bay, results in the lake having a relatively low wildlife productivity index (5.30). Red necked grebe is the only common breeding species.

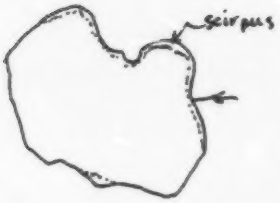
Water level fluctuations of ± .5 m would likely have little effect on productivity. Increases would flood trees and contribute to increased erosion. Decreases would decrease emergent zones.

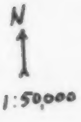
Upper Garnier Lake (Figure Mu4)

Upper Garnier Lake is a small, shallow lake surrounded by aspen dominated forest. The lake level is controlled by a massive beaver dam holding back about 1-1.5 m of water. Consequently much of the shoreline consists of flooded trees with considerable erosional features. The emergent zone is poorly developed giving the lake a relatively low productivity for waterfowl.

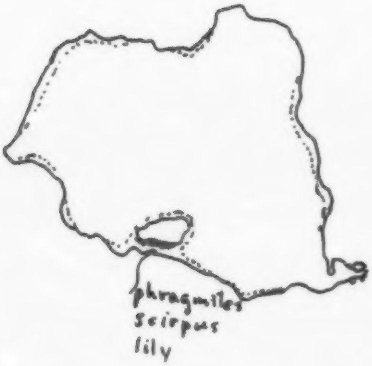
Beaver, however, occur in good numbers with 4 lodges present. Registered trappers in the area report 30-50 pelts annually over the past 3 years.

The present lake level depends on the presence of a beaver dam which is tentative and a significant decrease is possible. This would likely increase the use of the lake by waterfowl and muskrat providing the level remained





Beartrap Lake
Figure Mu3


phragmites
scirpus
lily

Ernestina Lake
Figure Mu7

fairly constant, allowing the development of emergents. Beaver use however would decrease because of decreased access to food and construction materials.

Lower Garnier Lake (Figure Mu5)

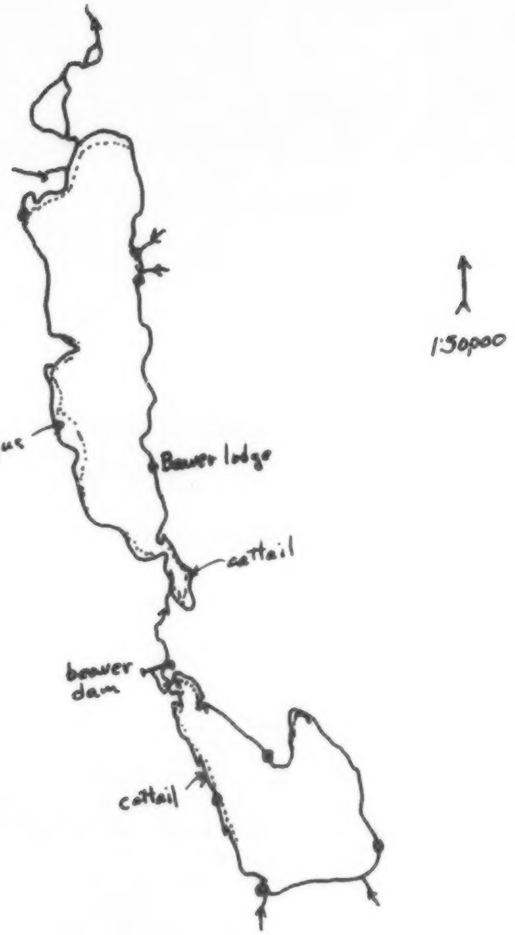
Lower Garnier Lake is a relatively small, narrow lake surrounded by mixed forest and is located in a steep north-south valley. Although scirpus is well developed along the west and north shoreline with the southern bay lined with cattail and willow, the lake has a relatively sparce waterfowl population (Index 5.91). The only species of note is common loon occurring in fair numbers.

Water level in the lake appears to have remained fairly constant, likely a result of the intensive beaver activity on the outlet stream which consists of a long series of dams and pools downstream to Muriel Lake.

Level manipulation of ± 1 m on Lower Garnier Lake will not have a significant effect on wildlife using the lake but will affect beaver downstream. Slow, intermittent flows are presently preventing damage to lodges and dams while maintaining winter access to lodges and food caches.

Jessie Lake (Figure Mu6)

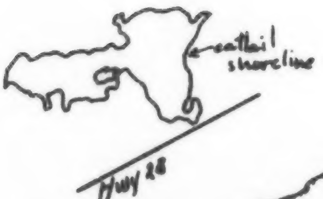
Jessie Lake is a small, very shallow lake having unique characteristics with respect to: (a) its inflow, aside from a small, natural basin, comes from the effluent from the town of Bonnyville (population 5000) which is located



1:50000
scirpus
Beaver lodge
cattail
beaver dam
cattail

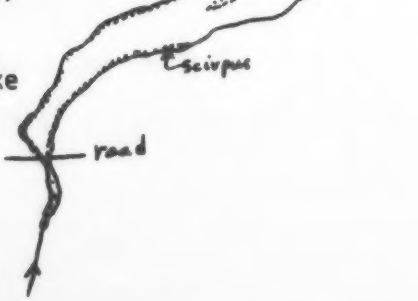
Lower Garnier
Figure Mu5

Upper Garnier
Figure Mu4



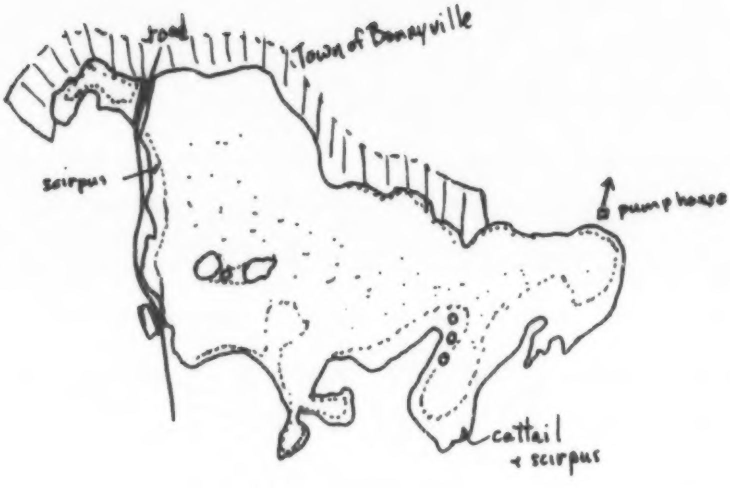
cattail shoreline
Hwy 28

Unnamed
Figure M10



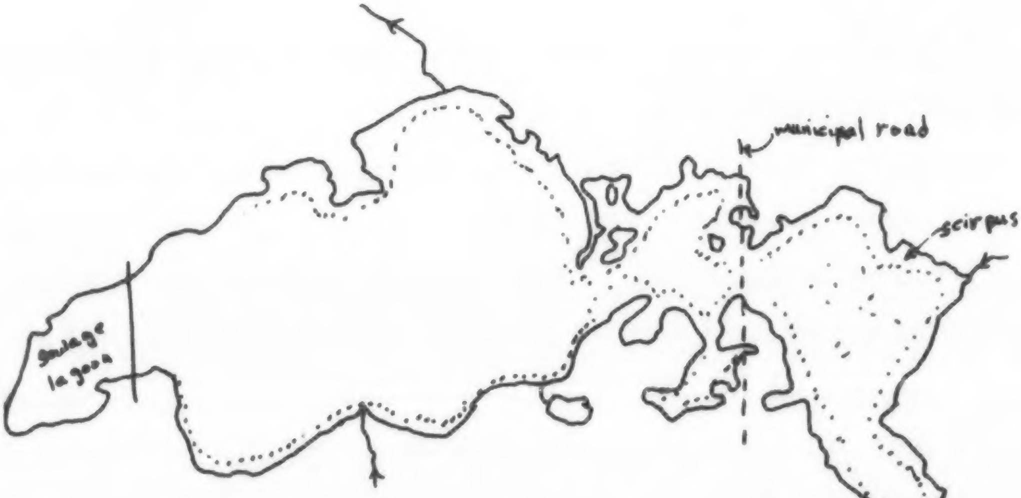
scirpus
road

Barreyrie Lake
Figure Mu9


road
Town of Bonnyville
scirpus
pumphouse
cattail + scirpus

Jessie Lake
Figure Mu6

N
1:50000


municipal road
scirpus
sewage lagoon

Charlotte Lake
Figure Mu8

along the north shore and (b) its level is controlled by pumping excess water into Barreyrie Lake.

The lake is located in an intensively developed agricultural area with very flat topography. The above facts result in a very low gradient bottom contour (max depth 2.5 m) and a highly fertile bottom substrate which is augmented by sewage nutrients from the town. Diverse and lush emergent vegetation covers about 1/3 of the surface area. Waterfowl, muskrat and shorebird production on the lake is phenomenal (index 27.19 - highest in the Beaver River basin). Most species common to NE Alberta can be found on Jessie Lake the most common include eared grebe (2 very large nesting colonies), coot, shoveller, lesser scaup, mallard and blue-winged teal. An unusually diverse complement of shorebirds are associated with the lake. The two natural islands contain excellent waterfowl nesting cover and have near record nest density (Brown 1975).

Ducks Unlimited have constructed several islands for a number of species including white winged scoter along the south shore of the lake to further enhance duck nesting densities.

Jessie Lake is currently exposed to a number of factors which could result in extreme changes in wildlife productivity.

1. the town of Bonnyville is developing the shoreline and pressures to drain the lake are mounting because of problems with the storm sewage system and the need for building sites.
2. a need to expand the sewage disposal system has resulted in the construction of a new lagoon associated with Charlotte Lake. This may reduce the inflow to the point where runoff can not maintain the present level and the lake may disappear.

The present lake level, agreed to among the town of Bonnyville, Ducks Unlimited and the Fish and Wildlife Division is optimal for waterfowl production. It cannot be increased without detrimental effects on the town and a significant decrease will severely reduce habitat quality and quantity.

Ernestina Lake (Figure Mu7)

Ernestina Lake is a relatively small, shallow (7.3 m) lake surrounded by mixed wood forest. Although the emergent zone is extensive and reasonably well developed, the lake supports relatively few wildlife species (Index 7.18) with lesser scaup, mallard, white-winged scoter, shoveller, bufflehead and golden eye being the most common waterfowl.

The effect of water level manipulation (± .5 m) would not likely result in major changes in waterfowl productivity.

Charlotte Lake (Figure Mu8)

Charlotte Lake is a very shallow (3 m) lake surrounded by open farmland. The low gradient shoreline is irregular and has an extensively developed and diverse emergent zone. Consequently wildlife species and abundance is relatively high (index 11.45) although not as high as expected. Lesser scaup, coot, eared grebe, mallard and bufflehead are the most common waterfowl. Of special note are canvasback, (fairly numerous), pied-billed grebe (location of nests not determined) and Canada goose (1 pair nesting).

Charlotte Lake has recently undergone two activities which resulted in partitioning (1) a north-south municipal road was constructed across the eastern end and a (2) sewage lagoon was constructed in a portion of the western end of the lake. The effect on wildlife was not likely detrimental because the two features added diversity.

The level of Charlotte Lake is presently controlled by a structure on the outlet. Further manipulation appears to be only a remote possibility. The present level is optimum for waterfowl and muskrat.

Barreyre Lake (Figure Mu9)

Barreyre Lake is a shallow, narrow lake surrounded by open farm land. It has a well developed emergent zone and is very productive for waterfowl (index 15.64) with coot, mallard, blue winged teal, lesser scaup and ruddy being the most common species.

Barreyre Lake receives the pumped effluent from Jessie Lake and its level is controlled by a natural sill in the outlet. With elimination of the former effluent from Bonnyville through Jessie Lake, Barreyre Lake may be subject to periodic level decreases which will detrimentally effect waterfowl by reducing the amount of suitable habitat.

Barreyre Lake is also associated with a highly productive waterbody on 20, 21-61-5-W4 where wigeon, lesser scaup, mallard and eared grebe are the main species (index 14.90). This waterbody is also threatened with elimination because of agricultural pressures. Pressure is expected to increase if Jessie and Barreyre Lakes disappear.

Landry Lake (Figure Mu2)

Landry Lake, located immediately downstream of Muriel Lake, has an irregular shoreline, a central island and a lush, highly developed emergent zone. Waterfowl and muskrat production is relatively high (index 13.76) with mallard, coot, blue-winged teal and lesser scaup being the most common species.

Water level is largely controlled by the level of Muriel Lake and is presently optimum for waterfowl production. The lake would be affected by any control structure built to manipulate levels on Muriel Lake. Such plans should consider the relatively high wildlife value of Landry Lake.

MOOSE LAKE RIVER SUBWATERSHED (Figure Mo1)

Moose Lake River subwatershed encompasses an area of generally flat to gently rolling topography with the exception of the Kehewin Creek valley and associated Moose Hills where topography is relatively steep. Except for the latter and the Kehewin Indian Reserve which is generally forested in aspen dominated mixed wood, the subwatershed has been influenced extensively by agricultural development in the form of cropland.

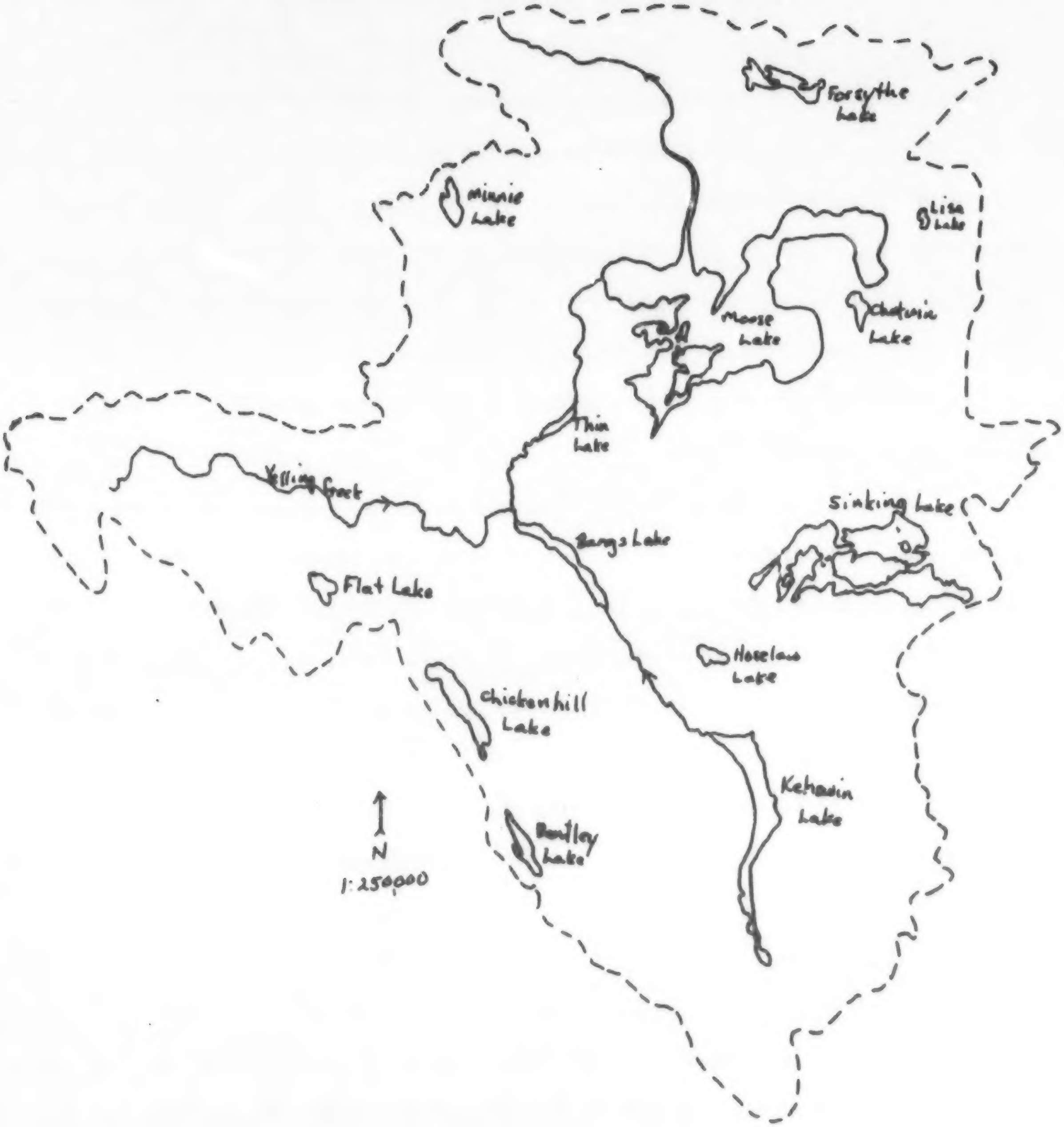
Water related wildlife in the area is characterized by waterfowl, muskrat, beaver, gulls and blue herons.

The use of fur resources in the area is by resident trappers (200 permits/year sold at Bonnyville) but records of harvest are largely not available. Waterfowl hunting is only moderate overall but concentrated in the Flat Lake and Forsythe Lake areas.

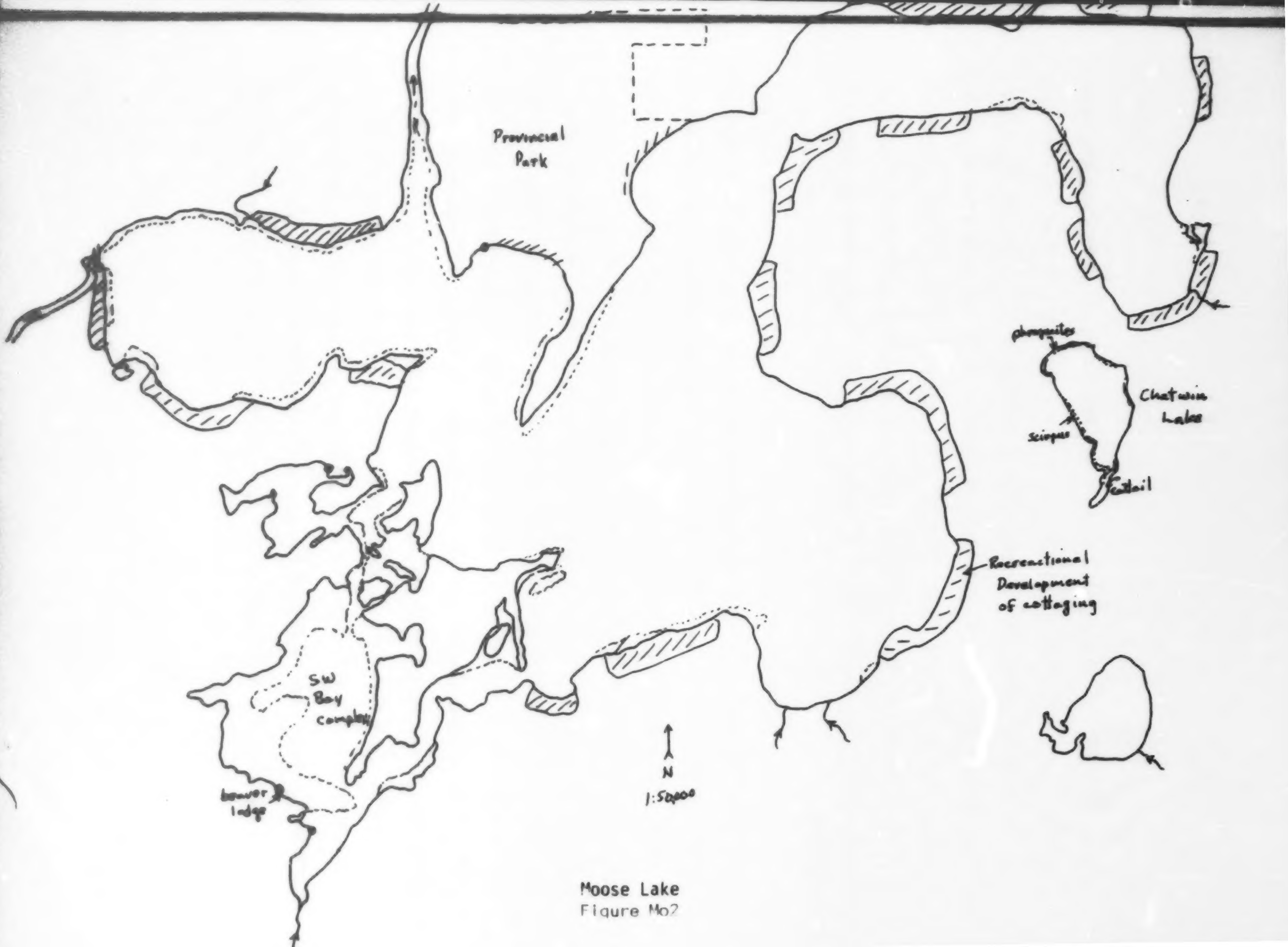
The aesthetic use of wildlife is an important item in this watershed especially on Moose Lake which is extensively developed for recreational use. Gulls, waterfowl, herons and pelicans are among the highly visible species which are an important asset to the tourist trade in the area.

Moose Lake (Figure Mo2)

Moose Lake is a moderate sized lake with a diverse shoreline. It is intensively developed for recreation in the form of campsites, beaches, parks, commercial operations and cottaging which have influenced the aspen dominated


Forsythe Lake
Minnie Lake
Lisa Lake
Moose Lake
Chatwin Lake
Thin Lake
Yelling Creek
Sinking Lake
Bangs Lake
Flat Lake
Hoselaw Lake
Chickenhill Lake
Kehewin Lake
Bentley Lake
N
1:250,000

Moose Lake River Subwatershed
Figure Mo1


Provincial Park
Chatwin Lake
phragmites
scirpus
cattail
Recreational Development of cottaging
SW Bay complex
beaver lodge
N
1:50,000

Moose Lake
Figure No2

backshore forest cover. Most of this development is located along shoreline which is exposed to wave and ice action where the emergent zone is absent or only moderately developed. Good waterfowl production areas remain undeveloped and consequently a good waterfowl species abundance and diversity occurs on the lake with the most common species being mallard, lesser scaup, wigeon and blue winged teal. Gulls, terns and loons are also well represented as well as most other parkland waterfowl species giving the lake an overall index of 10.03.

Osprey and blue heron have nested on the lake historically but are thought to have left because of relatively high recreational activity in the form of water skiing, angling, cottaging and campsite development. Although blue herons, pelican, and gulls do not presently nest on the lake they forage there and are highly visible, adding greatly to the aesthetic appeal of the area.

Level fluctuation in the past few years have been ± .6 m which may be partially influenced by an old Ducks Unlimited rock dam on the outlet. Level decreases of .2 m from historical mean will reduce the emergent zone and eliminate a significant amount of habitat by drying in the southwest bay-island complex which is the most productive portion of the lake.

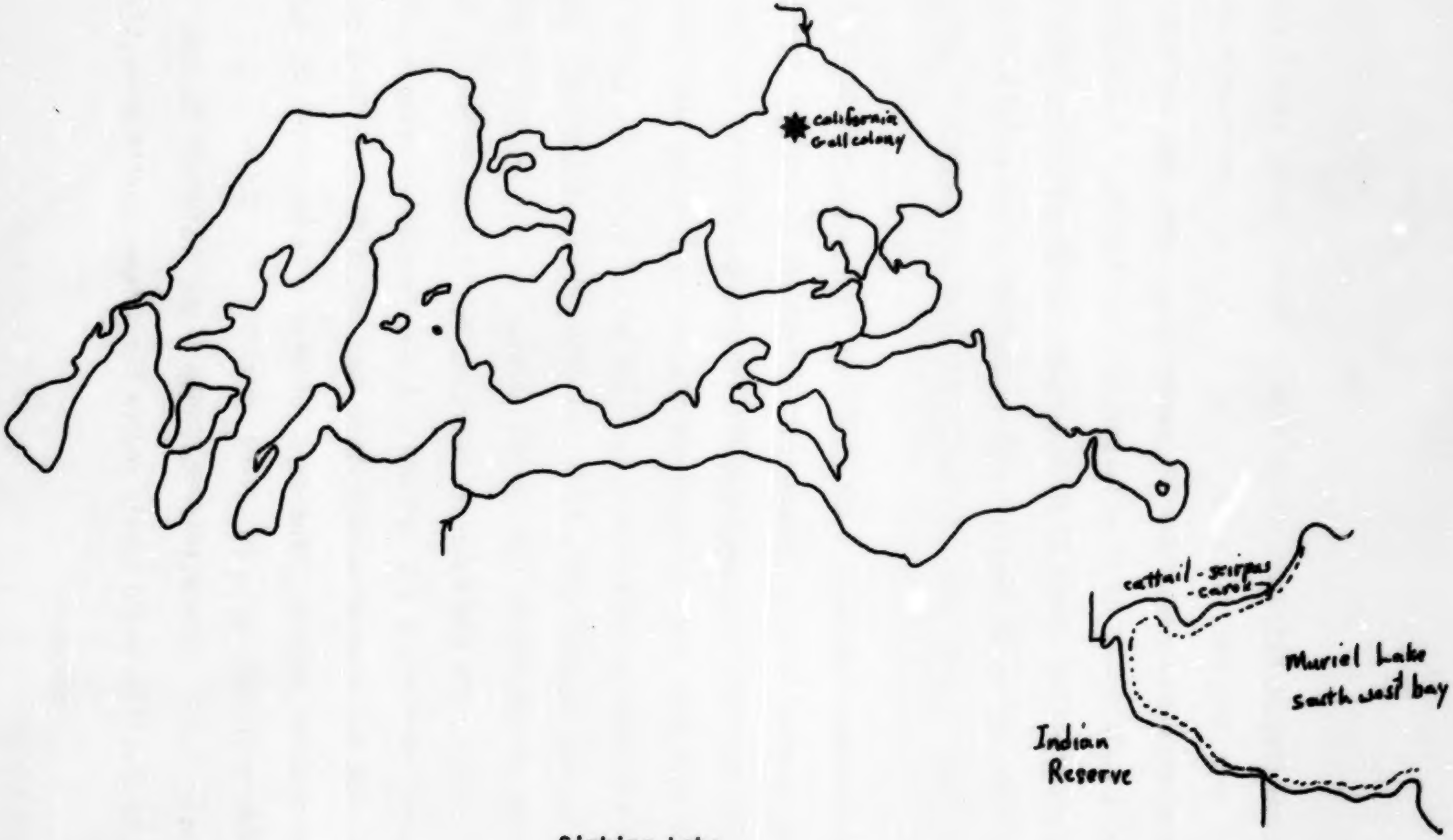
Level increases of .2 m would likely not change habitat quality or quantity significantly but increases beyond .2 m would reduce the emergent zone, cause erosion and reduce backshore nesting areas.

Sinking Lake (Figure Mo3)

Sinking Lake is unique in the Beaver River Watershed in that it is a discharge area with no well defined inlets or outlets. Consequently water levels are subject to dramatic fluctuations. Water quality is also unique in that the lake has an abnormally high concentration of salts resulting in a unique and lush aquatic flora and extensive salt encrusted mudflats during low water.

Aquatic fauna, although not surveyed, is unique and very prolific supporting abnormally high populations of waterfowl. It is not understood whether the shoreline provides adequate nesting cover or if the birds merely forage in the lake. It is suspected however that young are also produced there but the nesting habitat does not have normal marsh-like qualities. Most abundant species include mallard, lesser scaup, blue winged teal, gadwall and wigeon although many other species are present in good numbers (index 18.08). During fall migration the lake is important for staging of diving ducks such as goldeneye, bufflehead and scoters with many thousands being present during September. At the time of survey, over 4000 Franklin gulls were present but not thought to be nesting. The lake contains a large California gull colony (approximately 1000 nests in 1979).

Periodic level fluctuations have been the rule on Sinking Lake and attempts to stabilize would likely reduce the unique aquatic productivity.


california Gull colony
cattail - scirpus - carex
Muriel Lake
south west bay
Indian Reserve

Sinking Lake
Figure Mo3

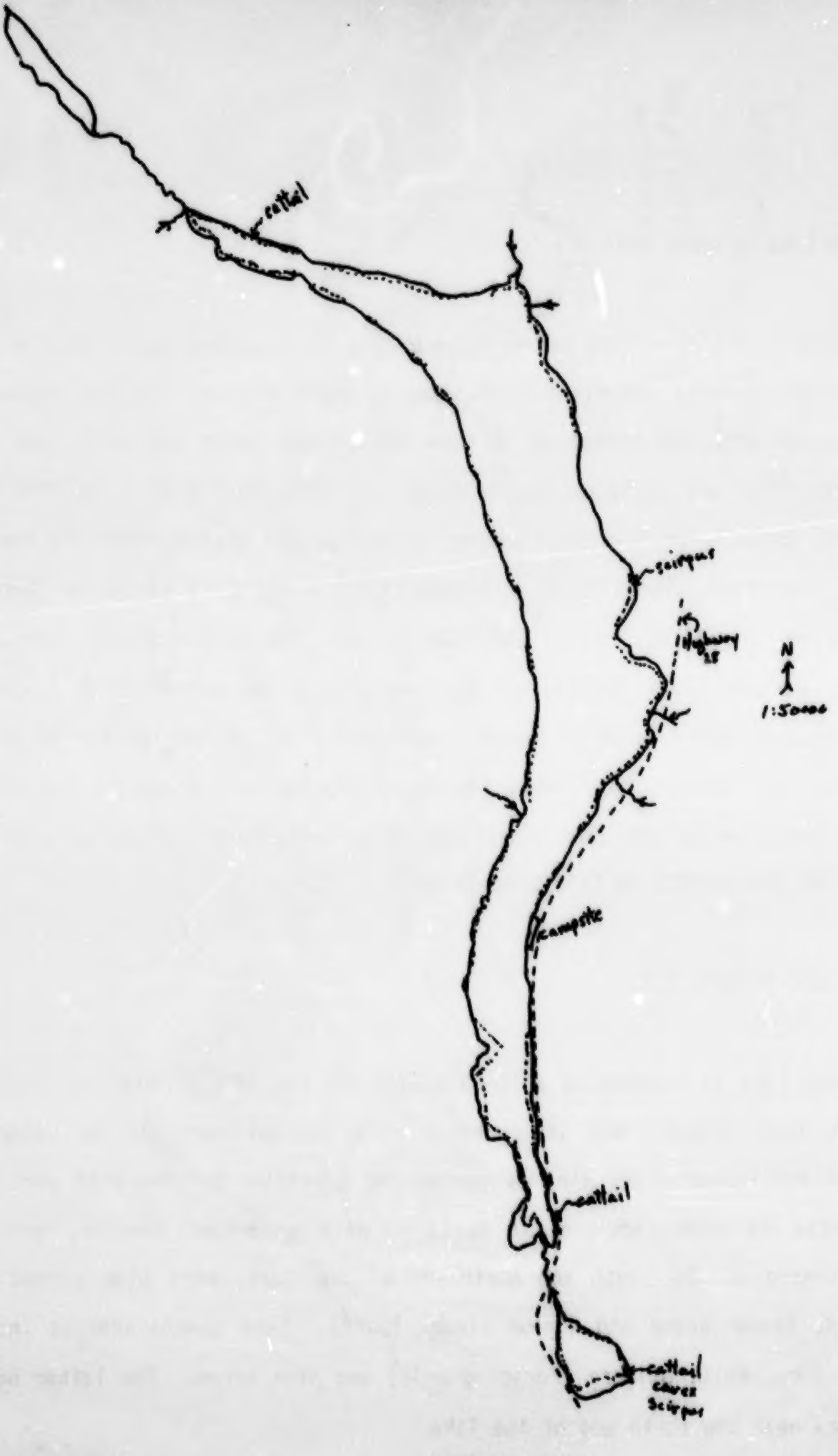
Kehewin Lake (Figure Mo4)

Kehewin Lake is a long narrow waterbody with a maximum depth of 10 m and a predominantly rocky shoreline surrounded by aspen forest. It has relatively steep banks with the exception of both the extreme south and north ends which is marsh like and contains the bulk of the waterfowl habitat on the lake. Mallard, gadwall, white-winged scoter, goldeneye and lesser scaup are the most common waterfowl (index 9.86). Highly visible foraging birds on the lake include white pelican, osprey and blue heron. The lake receives high use by anglers and the latter species add considerably to the aesthetics of the area.

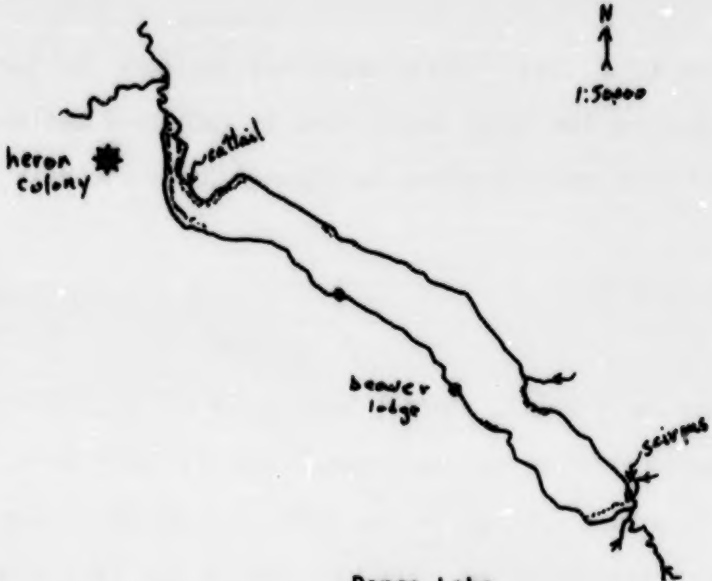
Increased water level in Kehewin Lake would not be detrimental to present waterfowl but would likely cause increased erosion and damage to highway 28. Lower levels would not add significantly to waterfowl production and would likely be detrimental to fish production.

Bangs Lake (Figure Mo5)

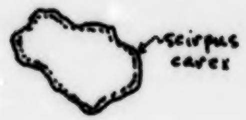
Bangs Lake is located in a steep valley and has characteristics similar to Kehewin Lake except that it contains more habitat suitable to waterfowl, muskrat and beaver. The lake is surrounded by willow for the most part which is backed by aspen and balsam poplar. Main waterfowl species, generally concentrated at the south and north end of the lake, were blue winged teal, mallard, lesser scaup and wigeon (index 11.28). Less common species included common loon, white pelican (foraging only) and blue heron. The latter nest in a colony near the north end of the lake.


cattail
scirpus
Highway
28
N
1:50000
campsite
cattail
cattail
carex
Scirpus

Kehewin Lake
Figure No4


N
1:50000
heron colony
cattail
beaver lodge
scirpus

Bangs Lake
Figure Mo5


scirpus
carex

Hoselaw Lake
Figure Mo8

Lowering the water level likely would not increase the waterfowl habitat appreciably. Raising the level would form an extensive wetland north of the lake but would likely cause problems on highway 28A by flooding the grade.

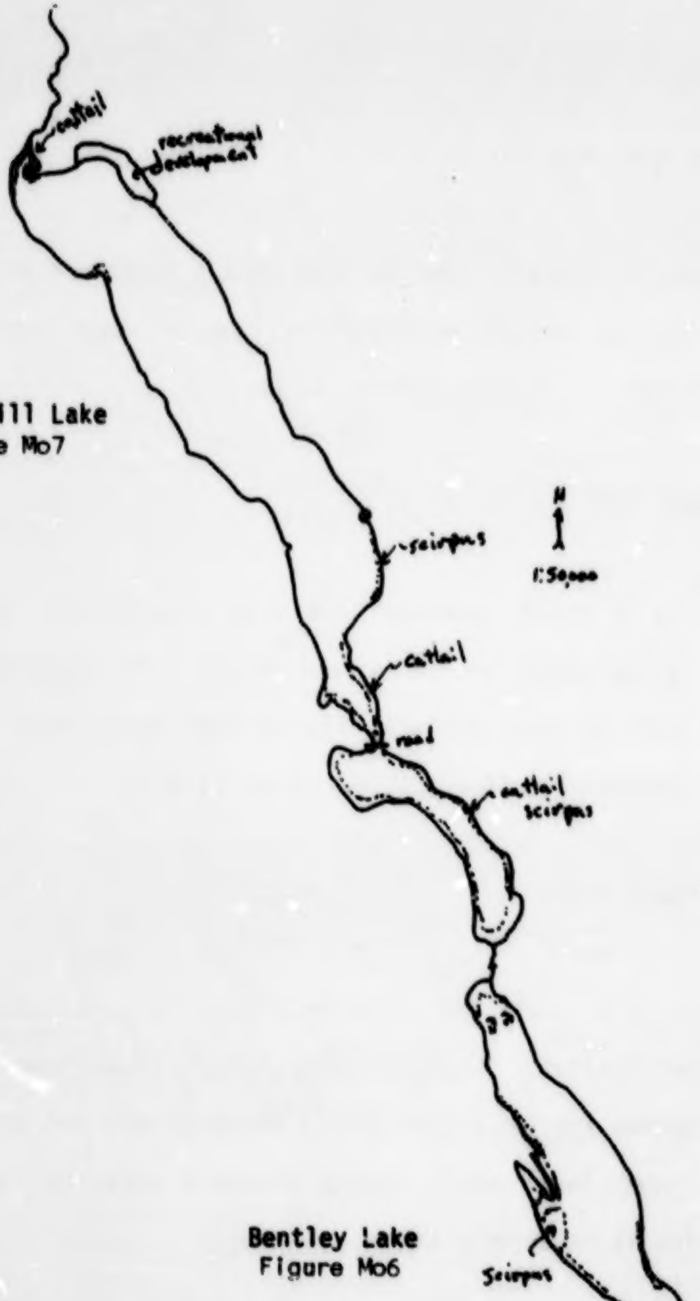
Bentley Lake (Figure Mo6)

Bentley Lake is a small, narrow, shallow (4 m) lake surrounded by aspen forest. Agricultural clearing has taken place in many areas very near the shore. Good waterfowl habitat on the lake is limited because of the rocky nature of much of the shoreline. The bay area on the west side provides some good habitat but in general the lake does not produce many waterfowl. An osprey nest, associated with the lake for many years has been destroyed.

Chickenhill Lake (Figure Mo7)

Chickenhill Lake is a narrow, relatively shallow lake with very little good waterfowl habitat because most of the shoreline is rocky or sandy. Although not abundant, the most common species include mallard, blue-winged teal, lesser scaup and white-winged scoter (Index 6.88).

Water level increases would likely improve waterfowl habitat.


cattail
recreational development
scirpus
N
1:50000
cattail
road
cattail scirpus
Scirpus

Chickenhill Lake
Figure Mo7

Bentley Lake
Figure Mo6

Hoselaw Lake (Figure Mo8)

Hoselaw Lake is a small, shallow lake with a backshore of grass and carex and a ring of scirpus around the shoreline. Lesser scaup and eared grebe are the most common species present (Index 11.16).

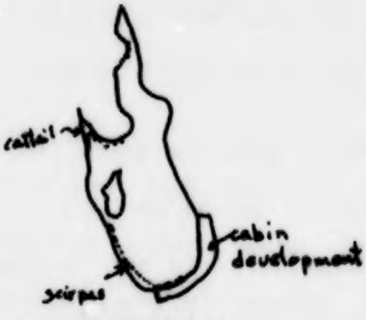
Liza Lake (Figure Mo9)

Liza Lake is a small, shallow lake with intermittent bands of scirpus emergents and a backshore of carex and grass. It contains a variety of waterfowl and muskrat with mallard, blue-winged teal, coot and eared grebe being the most common waterfowl species (Index 12.97).

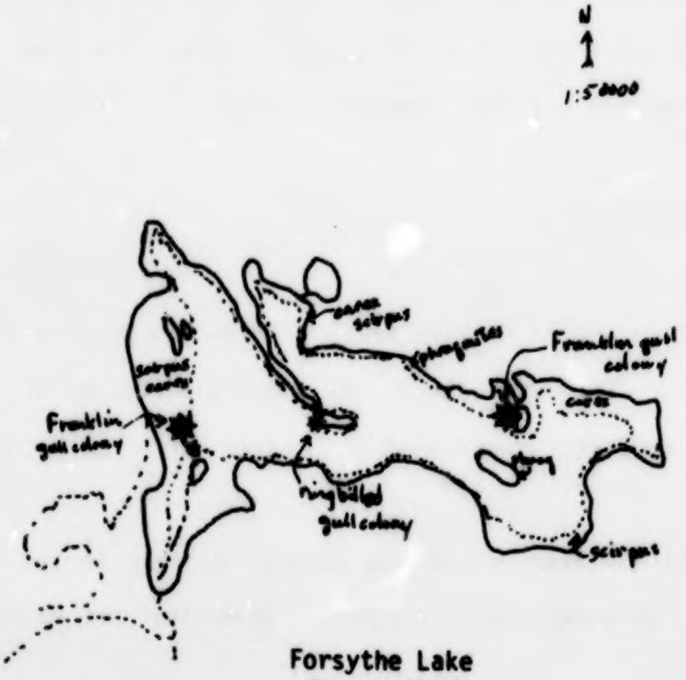
Minnie Lake (Figure Mo10)

Minnie Lake is a small but relatively deep lake (17 m) containing only limited waterfowl habitat. Mallard, lesser scaup, blue-winged teal and wigeon were the most common species (Index 10.32) although none are abundant.

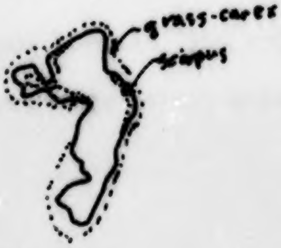
Increased water level would likely decrease waterfowl habitat quantity because shoreline is relatively steep.


cattail
cabin development
scirpus

Minnie Lake
Figure Mo10


N
1:50000
carex scirpus
phragmites
Franklin gull colony
carex
scirpus carex
Franklin gull colony
ring billed gull colony
scirpus

Forsythe Lake
Figure Mo12


grass-carex
scirpus

Liza Lake
Figure Mo9

Chatwin Lake (Figure Mo11)

Chatwin is a small lake of moderate depth (13.4 m) with a diverse emergent zone including scirpus, cattail and phragmites. It is surrounded for the most part by aspen forest although the north end is cleared for a golf course. The lake is used for a put-and-take rainbow trout fishery and receives some angling activity.

Waterfowl species are fairly diverse (Index 12.69) with coot, canvas back, wigeon, lesser scaup and eared grebe being most common. The lake also acts as a significant fall staging area for numerous species.

Forsythe Lake (Figure Mo12)

Forsythe Lake is a small, shallow marsh with a very diverse shoreline and emergent vegetation. The back shore has been altered mainly for cattle grazing but still consists predominantly of tree cover along the west and south sides.

Forsythe Lake is the most productive natural marshes in the Beaver River Basin with respect to water related species diversity and abundance (Index 21.47).

The most common waterfowl species are lesser scaup, coot and eared grebe all of which are very abundant. Canada geese (2-6 pairs) nest on the lake and several hundred stage there during spring and fall.

The most spectacular features of the lake are the large colonies of eared grebe, ring-billed gulls, common, black terns and Franklin gulls. The latter probably exceed 5000 pairs.

Muskrat are also abundant with over 200 pelts taken annually.

Any attempts to manipulate present water levels on Forsythe Lake must consider the valuable wildlife resources present.

REITA CREEK SUBWATERSHED (Figure R1)

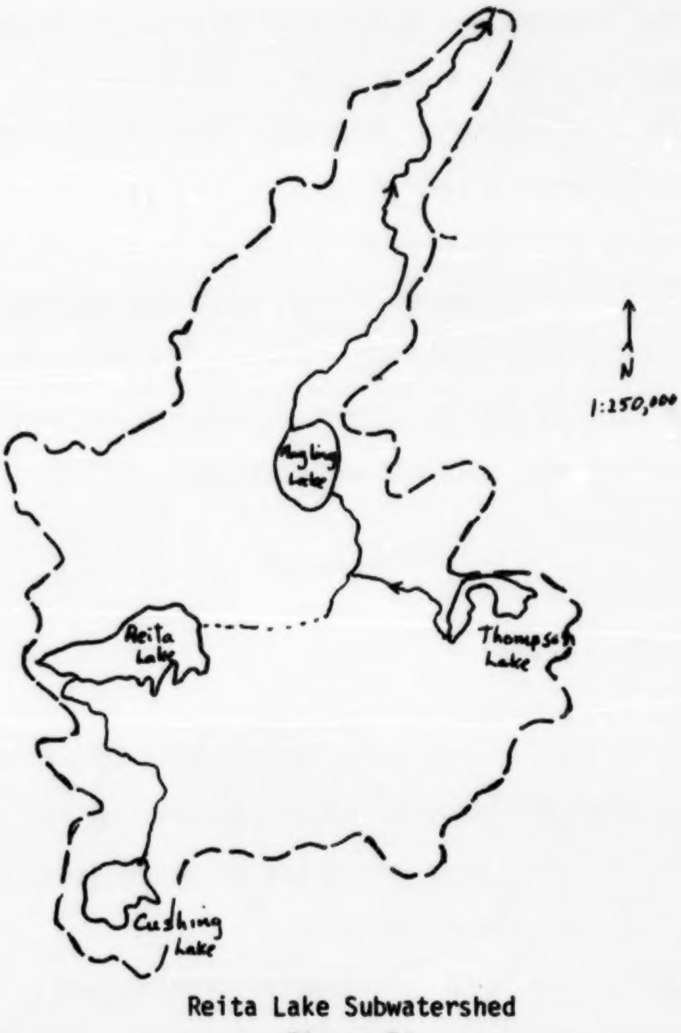
The Reita Creek subwatershed encompasses an area of very gently rolling topography forested generally in aspen which is regenerating from a severe forest fire regime. Agricultural activities have reduced forest cover in better soil areas near Angling Lake area while the remainder of the watershed is restricted to unimproved cattle grazing because of low soil fertility.

Water associated wildlife resources are relatively abundant in the area. The shallow lakes and sloughs with well developed emergent beds and marsh-like backshores provide good habitat for waterfowl, muskrat and mink. The numerous low gradient, meandering, intermittent streams add to productivity by providing excellent beaver habitat.

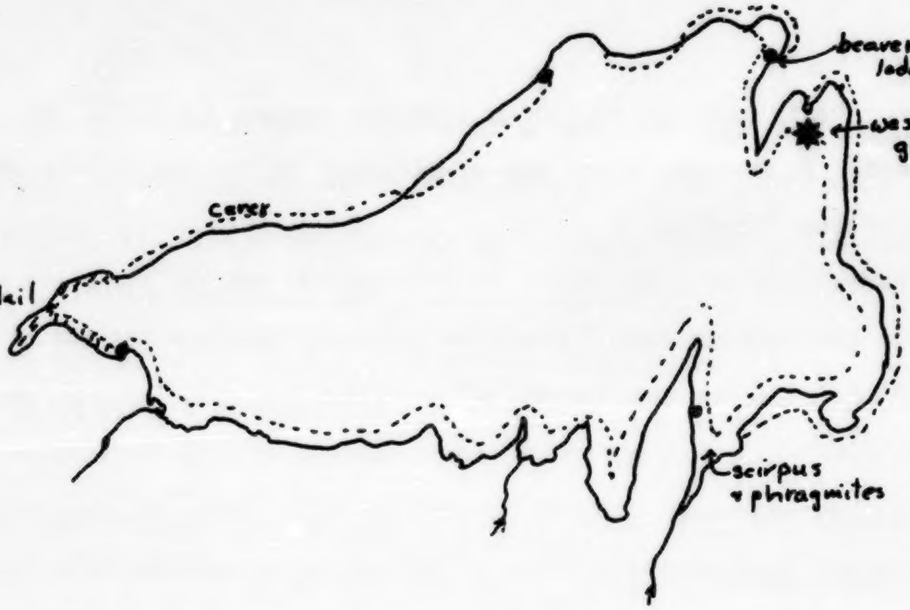
Reita Lake (Figure R2)

Reita Lake is a shallow lake with an irregular shoreline and diverse emergent vegetation including scirpus, cattail and pharagmites. The immediate backshore consists of open carex and grass along the east and northwest. Aspen forest surrounds the lake on the upland.

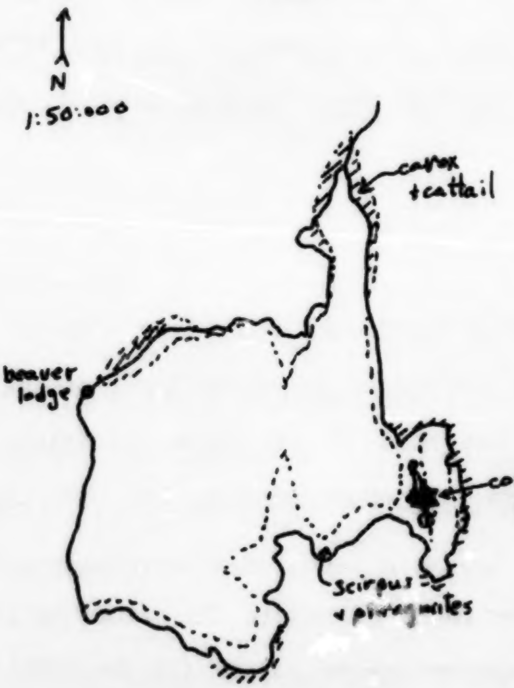
Waterfowl species are well represented with wigeon, lesser scaup, white-wing scoter, coot and rednecked grebe being most common (Index = 7.76). The lake contains one of the few western grebe colonies with 130-150 nests (1980).


Mayling Lake
Reita Lake
Thompson Lake
Cushing Lake
N
1:250,000

Reita Lake Subwatershed
Figure RI


beaver lodge
western grebe colony
carex
cattail
scirpus + phragmites

Reita Lake
Figure R2


N
1:50:000
carex +cattail
beaver lodge
common tern colony
scirpus + phragmites

Cushing Lake
Figure R4

In the past Reita Lake was subject to flooding because the outlet was very poorly defined. A drainage ditch was constructed during the 1960's which partially alleviated flooding.

Level fluctuations of 1 m result in moderate changes in shoreline with most affect in the numerous bays. Reduction in level therefore has the effect of significantly reducing the length of shoreline by reducing bay depth. Increases in level flood some additional marsh habitat and likely increase the useable area for waterfowl. Resulting increase in wave and ice action probably would not have adverse effects on western grebe because their colony is located in a protected bay.

Annual fluctuations from any proposed water withdrawl would reduce the extent of emergents and would likely lead to a long term level decrease because of the relatively low flow-through presently being experienced.

Angling Lake (Figure R3)

Angling Lake is a small, round lake with a very regular shoreline. Much of its backshore has been influenced by agricultural activities with just a fringe of forest cover along most of the shore. A fringe of scirpus with cattail and carex in shallow water borders the lee shores (north and northwest).

The lake is only moderately productive for waterfowl (Index 7.91) and muskrat. It contains a western grebe colony (76 in 1980) and is used by foraging white pelican and white-winged scoter during post breeding molt.

Level fluctuations would have a moderate but uniform effect on the shoreline because of the regular nature of the shoreline. The effect on existing wildlife would therefore be minimal. However, the effect of current water regime downstream would influence beaver use.

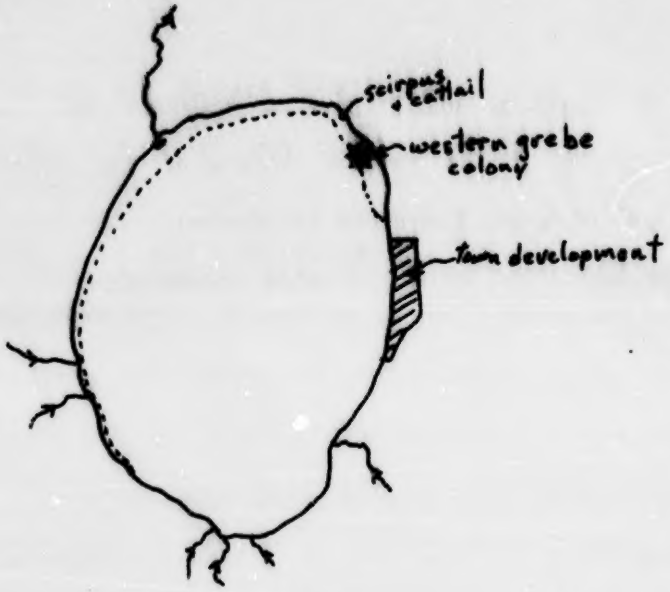
Cushing Lake (Figure R4)

Cushing Lake is less than 4 m in depth with very abundant and diverse emergent vegetation in the form of scirpus, phragmites, cattail and carex. This combination provides a good habitat for waterfowl and muskrat with most common species being mallard, shoveller, coot, red-necked grebe (Index 8.17). Bufflehead and white-winged scoter are common molters. The lake also contains a common tern colony (70 in 1980) which is one of two known in the Beaver River Basin.

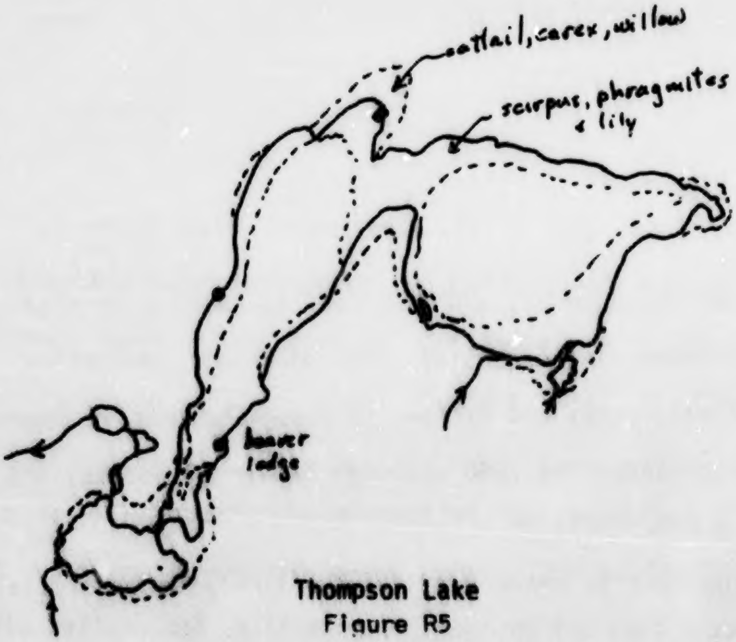
Thompson Lake (Figure R5)

Thompson Lake is a small, shallow lake surrounded by mixed-wood forest. Emergent development is extensive and abundant consisting of scirpus, phragmites, cattail, carex and willow. Although habitat is diverse, waterfowl were not well represented in 1980 although beaver (3 lodges) and muskrat were present (Index 8.88).

A slight increase in water level would likely be beneficial to wildlife productivity.


scirpus & cattail
western grebe colony
Town development
N
150,000

Angling Lake
Figure R3


cattail, carex, willow
scirpus, phragmites & lily
beaver lodge

Thompson Lake
Figure R5

JACKFISH CREEK SUBWATERSHED (Figure J1)

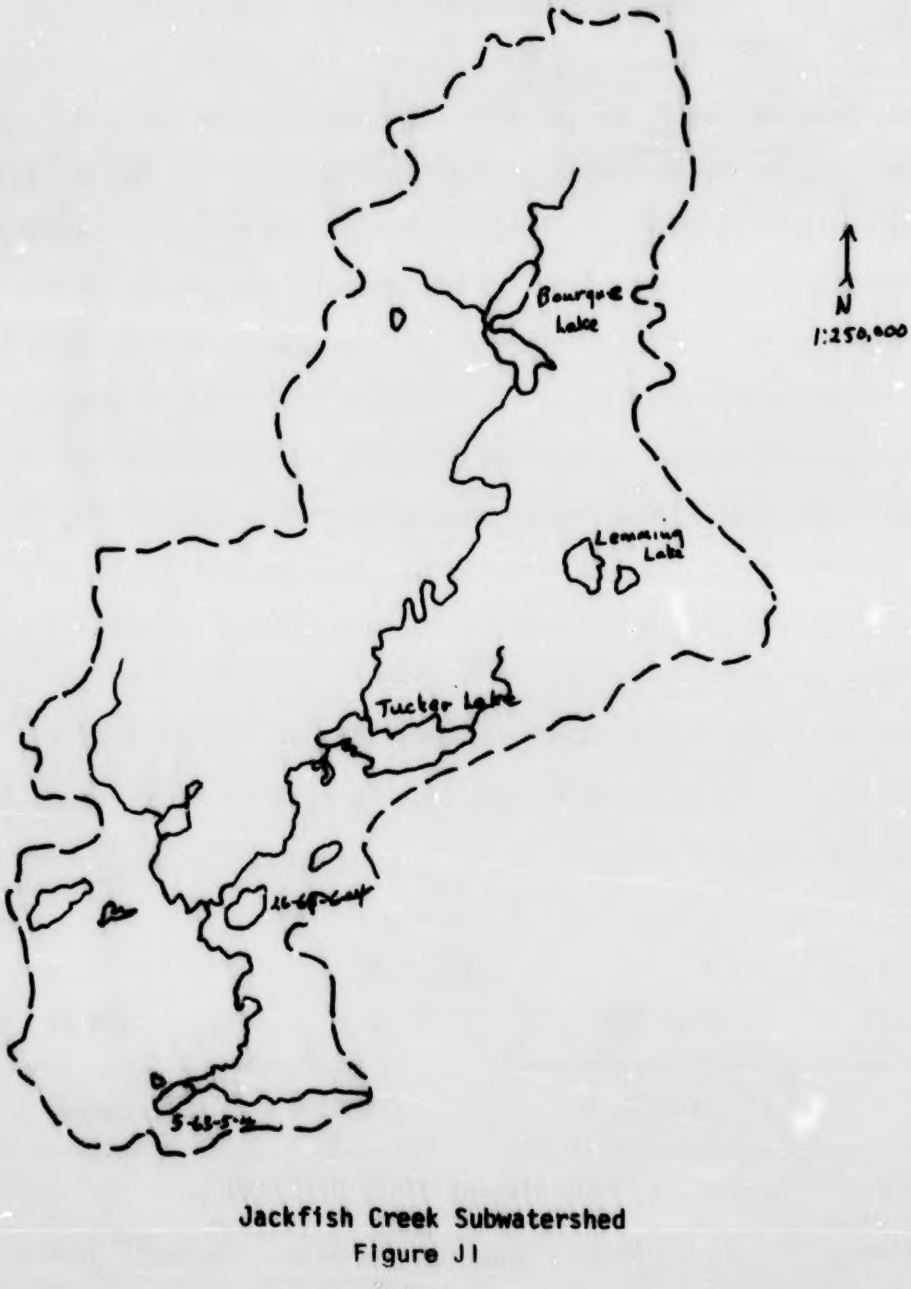
The Jackfish Creek Subwatershed is characterized by small lakes, low gradient, meandering streams in gently rolling topography for the most part in a very diverse boreal mixed-wood forest. Agricultural activities have significantly altered tree cover in the southern portion and in the area south of Marguerite Lake where cropland and improved grazing are the main features.

Water associated wildlife in the northern two-thirds of the Jackfish Creek subwatershed is largely represented by beaver while some of the rarer species include river otter, blue heron, osprey and bald eagle. The Bourque Lake area, Jackfish Creek and its tributaries upstream from Tucker Lake constitute some of the best beaver habitat in Alberta (Figure M2 and Table J1) (Boyd 1977, Searing 1979).

Jackfish Creek subwatershed includes 215 sq. mi. or 2.6% of the Beaver River Basin. Trapping returns from registered areas which cover 80% of the subwatershed are as follows:

Table J1

Year	1978-79	1979-80	1980-81
Value	$13011	$20896	$8357
% of total Beaver River fur value	16.2	14.7	7.2


Bourque Lake
N
1:250,000
Lemming Lake
Tucker Lake
16-63-6-W4
5-63-5-W4

Jackfish Creek Subwatershed
Figure J1

Waterbodies in the southern two thirds of the subwatershed are shallow and marsh-like, supporting relatively abundant populations of muskrat, waterfowl, and water associated birds.

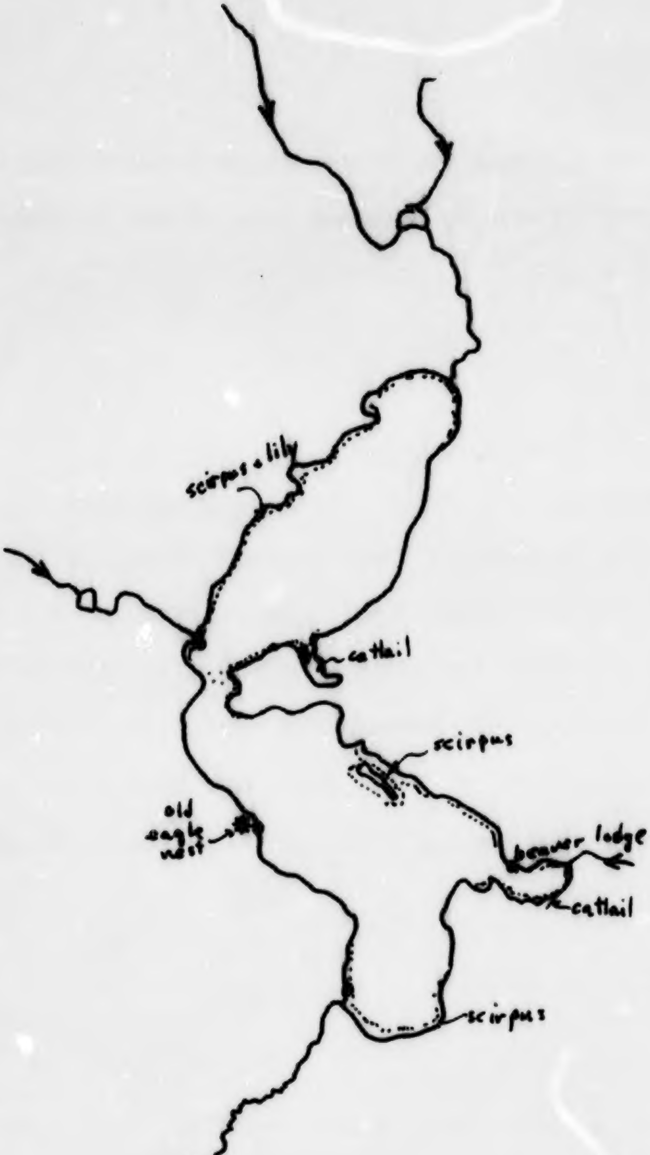
Bourque Lake (Figure J2)

Bourque Lake is relatively remote, surrounded by mixed forest, has a few marsh areas along the east-central and southern shoreline but is relatively unproductive for waterfowl (Index 6.48). It is considered a typical boreal lake with habitat suitable for loon, bald eagle, osprey, merganser and bufflehead. It is important for beaver, otter and mink (Searing, 1979).

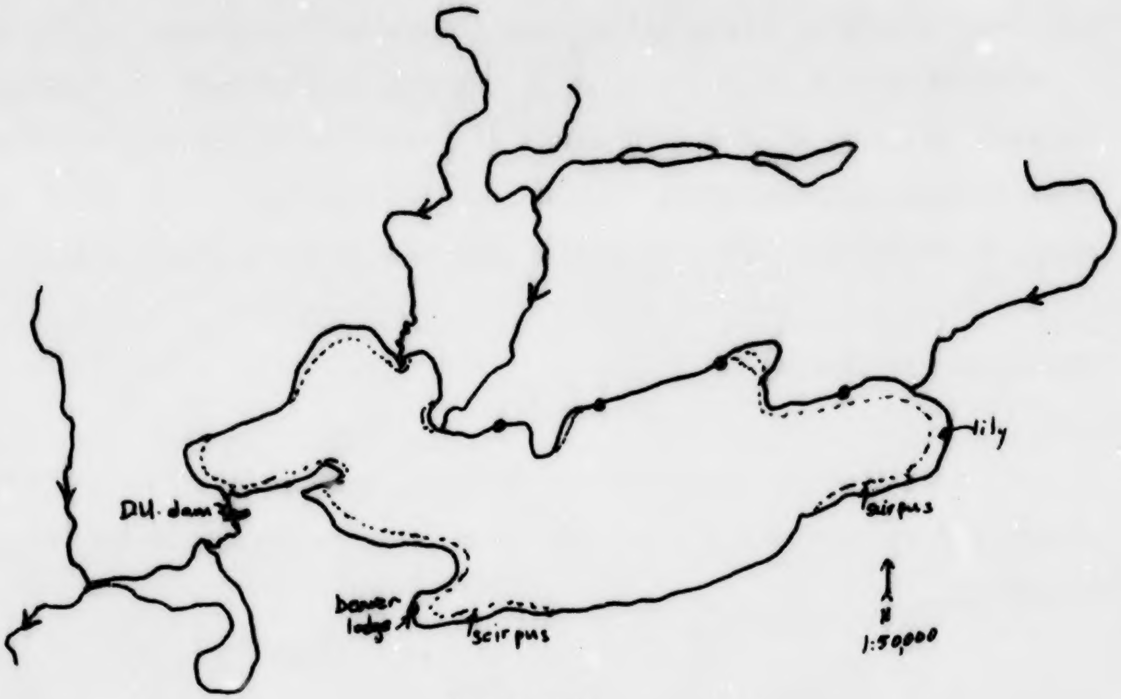
Water level fluctuations of .5m will not have great consequences on existing wildlife, however present winter flow rates downstream must be maintained.

Tucker Lake (Figure J3)

Tucker Lake is a relatively small, shallow lake with sandy shores surrounded by mixed forest of aspen, white spruce and pine. Emergents, mainly scirpus and pond lily are fairly well developed on much of the shoreline. An old Ducks Unlimited structure on the outlet has maintained a fairly constant waterlevel.


scirpus & lily
cattail
scirpus
old
eagle
nest
beaver lodge
cattail
scirpus

Bourque Lake
Figure J2


lily
D.U. dam
scirpus
beaver lodge
scirpus
N
1:50,000

Tucker Lake
Figure J3

Waterfowl productivity on the lake is only moderate (Index 8.10) while beaver production is relatively high (Table J1). The lake is used also as a post-breeding molting area by white-winged scoters and buffleheads.

Wildlife habitat is only moderately sensitive to waterlevel fluctuations. Increases in excess of .5 m would result in a reduction of emergents and flood trees reducing wildlife habitat values. Similar reductions would reduce the extent of the emergent zone with similar effects on wildlife productivity.

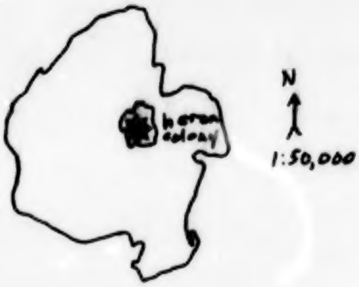
Lemming Lake (Figure J4)

No information is available for wildlife on Lemming Lake with the exception of the fact that a small blue heron colony is present on the central island.

Unnamed Lake - 5-63-5-W4 (Figure J5)

This small, shallow waterbody is surrounded by mixed wood forest and contains concentric rings of willow, carex, cattail and pond lily, progressing from shore to open water. Mallard, wigeon, blue-winged teal, coot and lesser scaup are the main waterfowl species. An index was not calculated because of an incomplete survey. Furbearers include muskrat and mink although no quantitative information is available.

Fluctuating water levels of ± .5 m are necessary to prevent total encroachment into the open water by cattail which would likely decrease productivity.


heron colony
N
1:50,000

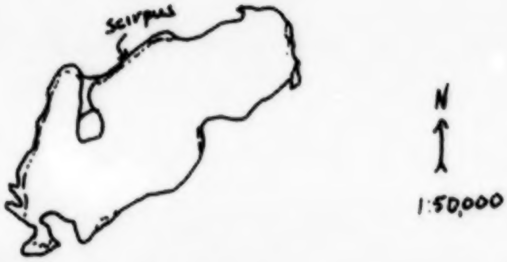
Lemming Lake
Figure J4

Unnamed Lake 26-63-6-W4 (Figure J6)

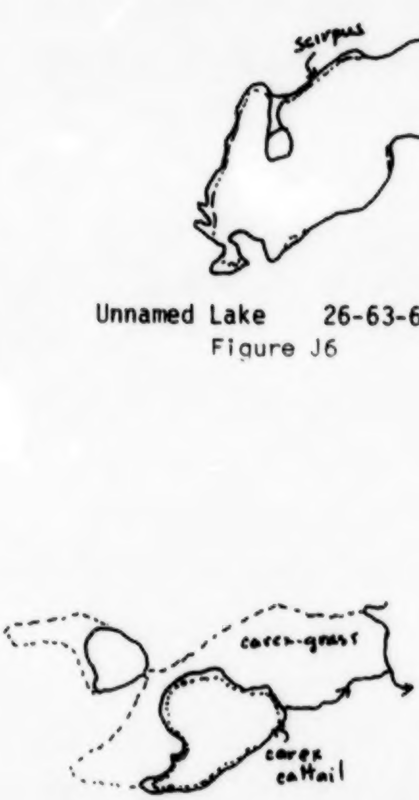
This small shallow lake contains excellent waterfowl and muskrat habitat. The shoreline consists of scattered and clumps of scirpus with an immediate backshore of carex, grass and willow providing abundant nesting cover. Most common waterfowl species are lesser scaup, blue-winged teal, mallard, coot and eared grebe (Index 14.02). A large number (200) of Franklin gulls are associated with the lake. Two points of particular interest however are (1) a relatively large number of avocets (rare in NE Alberta) were present and (2) 40 sandhill cranes were sighted and may have been nesting in the area. The latter is suspected for the Jackfish Lake watershed but not confirmed. If so it will be the southern most record of this species nesting on a regular basis in Alberta.

Water level in the lake likely fluctuates considerably because Jackfish Creek flows through it. This fluctuation is likely the cause of the absence of tree cover near the water which provides good nesting cover and perhaps Sandhill Crane habitat. The timing of spring flooding and drawdown is therefore very important to prevent nest flooding. This is presently controlled by water flows in the creek which in turn is likely somewhat dependent on beaver activity to damp or spring runoff.

A number of other productive marshes occur in the subwatershed but no surveys have been conducted.


scirpus
N
1:50,000

Unnamed Lake 26-63-6-W4
Figure J6


carex-grass
carex
cattail

Unnamed Lake 5-63-5-W4
Figure J5

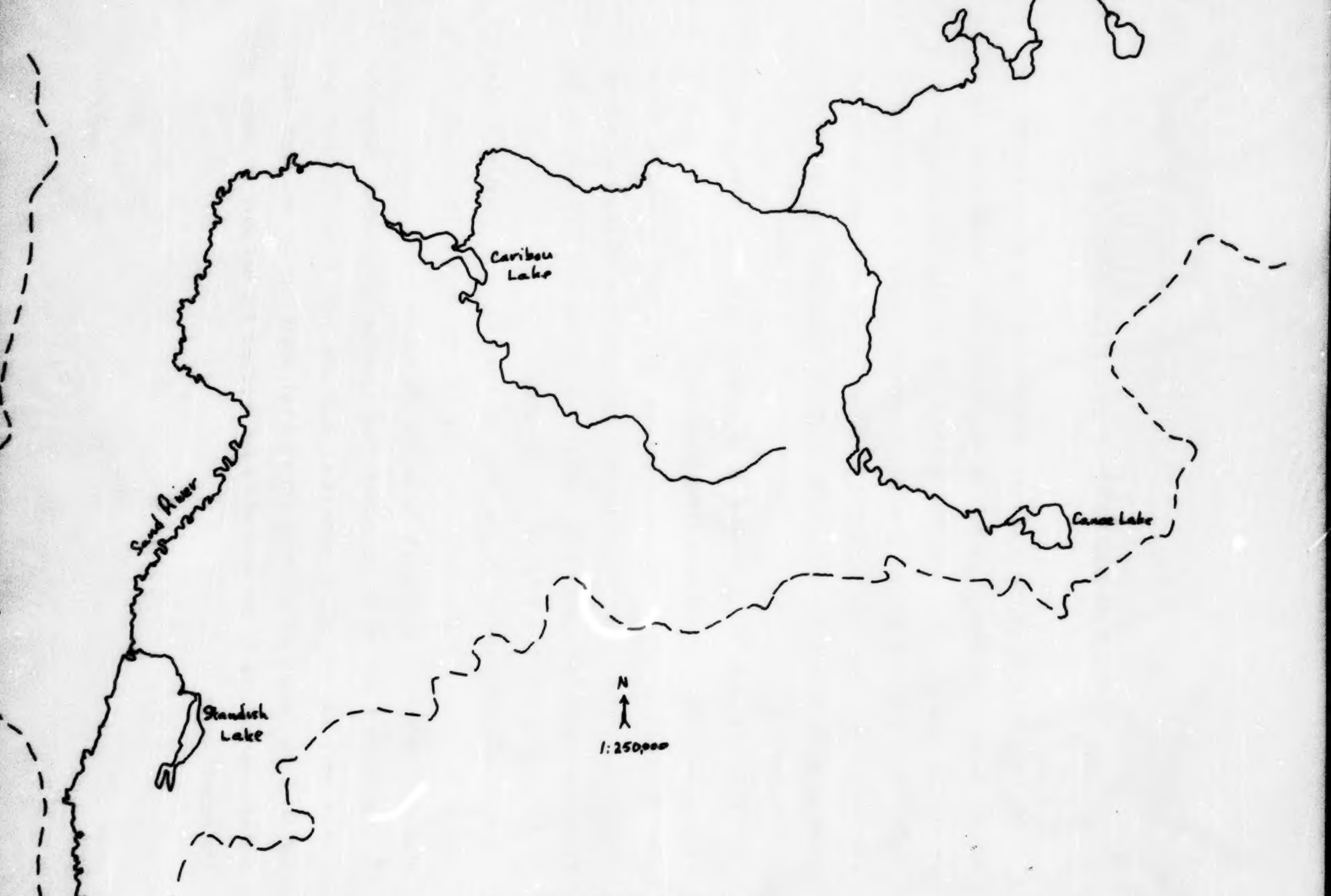
SAND RIVER SUBWATERSHED (Figures S1a and S1b)

The large majority of the Sand River Subwatershed lies within the DND Air Weapons Range. Topographic relief is relatively very low with few large waterbodies present. The area is characterized by numerous small muskeg sloughs interconnected by low gradient, meadering streams. No quantitative wildlife surveys have been conducted. However, river otter and beaver are known to be relatively abundant in the area. As trapping is prohibited there is no estimate of productivity.

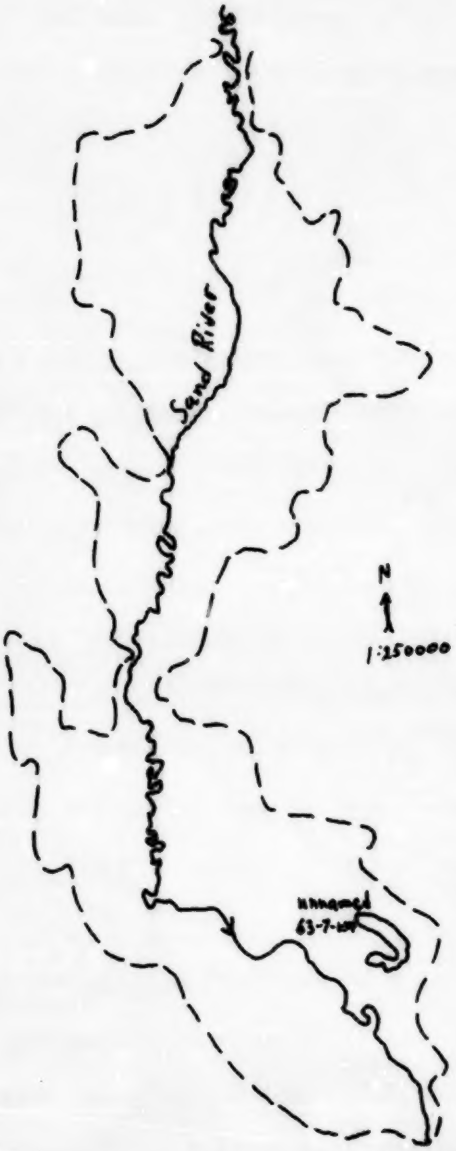
Preliminary work on an ongoing otter ecology study (D. Ried - U. of Calgary) indicates that the Sand River Subwatershed is the stronghold of river otter in Alberta. This is because of (a) the low gradient, meandering stream habitat fed gradually but at a low rate by water from surrounding muskegs which provides suitable year-round conditions of access and food supplies and (b) the absence of exploitation by past trapping.

Waterfowl productivity in the area is thought to be relatively low. However it is likely that many rarer species are present because of the absence of industrial development in the DND Air Weapons Range.

The southern portion of the subwatershed contains much steeper topography with a well defined valley associated with the Sand River. Uplands are dominated by aspen poplar with interspersed white spruce and much less muskeg. Agriculture in the form of forage cropland has had some influence on the natural cover.


Caribou Lake
Canoe Lake
Sand River
Standish Lake
N
1:250,000

Upper Sand River Subwatershed
Figure S1a


Sand River
unnamed
63-7-104
N
1:250000

Lower Sand River Subwatershed
Figure S1b

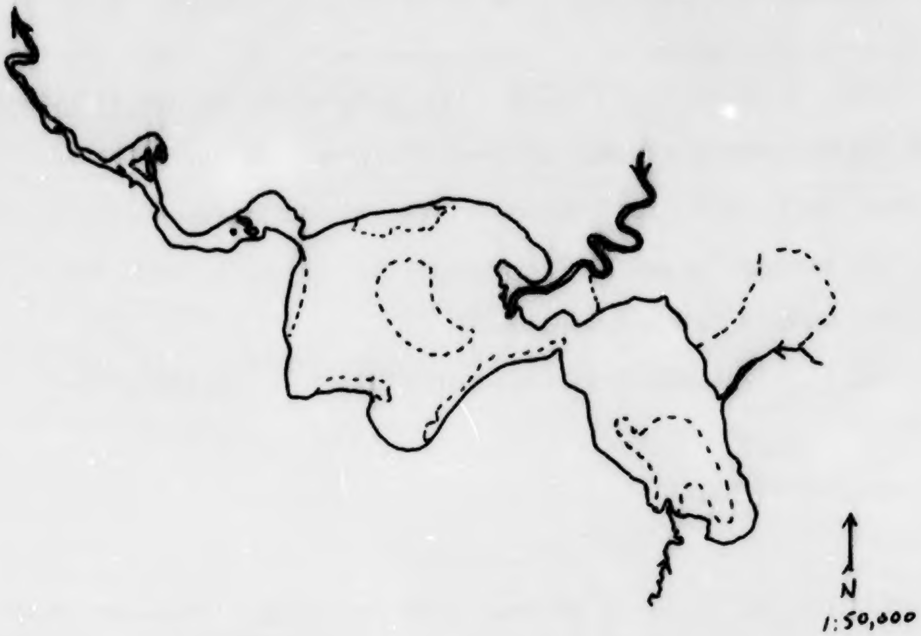
Water associated wildlife productivity does not increase significantly because of the steep stream gradient, relatively few waterbodies and low fertility soil types.

Caribou Lake (Figure S2)

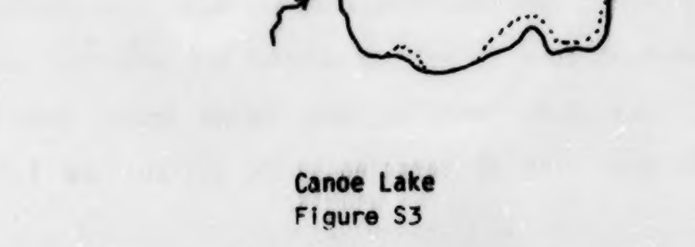
Caribou Lake is a depressional waterbody along the course of the Sand River which is very shallow and likely subject to periodic extreme changes in water area. No quantitative wildlife surveys were conducted. However because of configuration, extensive emergent beds and relative shallowness, it is likely a productive area for waterfowl, beaver, muskrat and river otter. In addition, it likely provides suitable habitat for sensitive species such as bald eagle, osprey and white pelican.

Small level changes (1 m) have profound effects on associated vegetation (McGregor, 1981). Periodic flooding and drying has created a large riparian community of carex, willow, which is likely of local significance to moose and caribou.

Because of a long history of fluctuations, species associated have likely adapted and are dependent upon these naturally occurring changes. Stabilizing the lake at a near-constant level would reduce the area affected by periodic flooding and reduce wildlife productivity. Level controls on the lake would also influence the downstream flows in the Sand River which would affect beaver and otter.



Caribou Lake
Figure S2



Canoe Lake
Figure S3

Canoe Lake (Figure S3)

Canoe Lake is a small, shallow lake surrounded by conifer dominated mixed-wood located within the DND air weapons range. No quantitative wildlife surveys have been conducted however from a short reconnaisance visit, waterfowl and muskrat productivity appears to be relatively low although scirpus development is fairly extensive.

The potential effect of water level manipulation is not known.

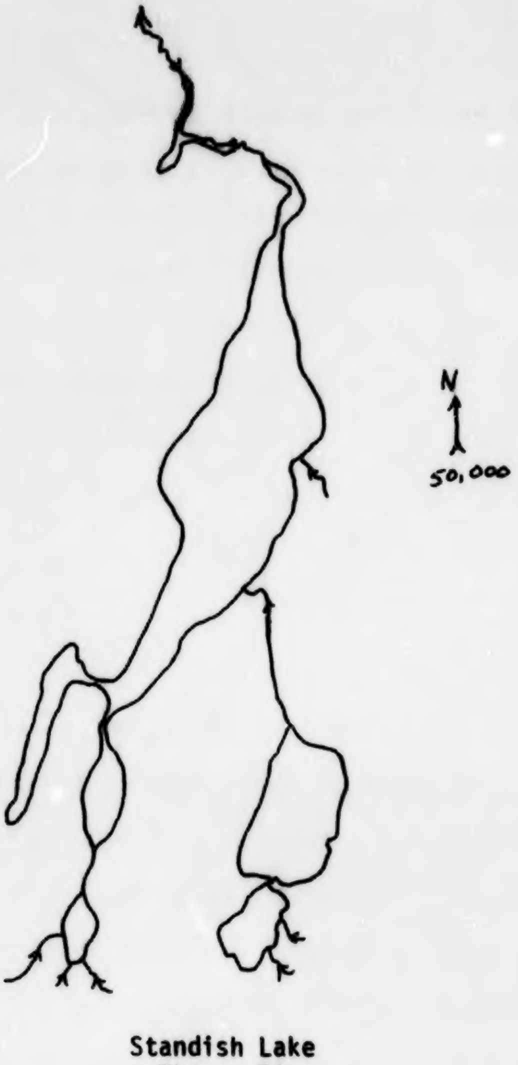
Standish Lake (Figure S4)

Standish Lake is a very shallow lake with an irregular shoreline, surrounded by a border of riparian willow and carex with a back shore of conifer dominated mixed wood forest. Most of its surface is covered in pond lily and scirpus. No wildlife surveys have been conducted. From aerial photo investigation it appears that the lake may have a significant beaver population but is likely only of limited value to waterfowl.

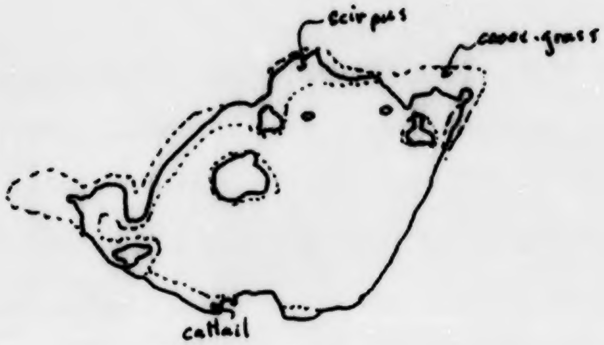
Unnamed Lake 18-63-7-W4 (Figure S5)

This waterbody is small, shallow, irregular shaped and surrounded by mixed wood forest. The emergent zone is well developed and waterfowl productivity is relatively high (Index 13.58) with mallard, lesser scaup, coot being most common. The lake is also used by foraging white pelican and 1-2 pairs of nesting Canada geese.

Although emergent vegetation is well developed the immediate backshore is relatively steep. Increased water level (1 m) would likely result in minimal habitat loss.

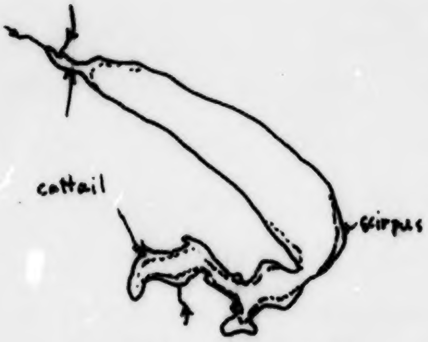


Standish Lake
Figure S4


scirpus
carex grass
cattail

Stebbing Lake
Figure B4

N
1:50,000


cattail
scirpus

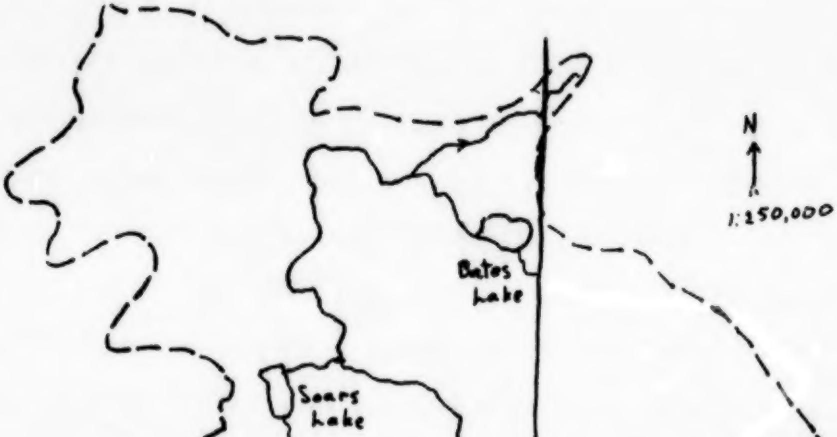
Unnamed 18-63-7-W4
Figure S5

RED SPRING CREEK SUBWATERSHED (Figure Rd1)

The portion of Red Spring Creek Subwatershed within Alberta contains an area of gently rolling topography with a small band of agricultural cropland development across the northern portion. The remainder is located within the Elizabeth Metis Colony and a small portion in the northwest is within Cold Lake Indian Reserve. These areas are generally forested in mixed wood which has undergone a harsh fire regime over the past several years leaving the forest somewhat poorly developed with many areas of new regrowth and fallen trees. The subwatershed contains a few small shallow lakes and muskegs connected by intermittent, meandering streams. The general productivity for wildlife in the watershed is relatively high, especially for moose and deer (Gunderson, 1981).

Water related wildlife habitat associated with the small streams supports beaver, muskrat and mink. Although only a small portion of the area is available to and trapped by registered trappers, the catch recorded in 1979-80 was 84 beaver, 141 muskrat and 7 mink worth a total of $4250.00.

The value of water related habitat associated with the small shallow lakes is relatively unknown with the exception of Bates Lake. Soars, Redspring, Day, Willow and Chandler Lakes appear from aerial photos to have characteristics similar to Thompson Lake in the Reita Creek subwatershed, i.e. suitable for muskrat, several species of waterfowl and beaver.

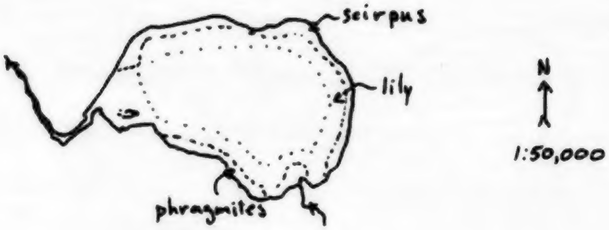

N
1:250,000
Bates Lake
Sears Lake
Chandler Lake
Redspring Lake
Alta
Sask

Red Spring Creek Subwatershed
Figure Rd1

Bates Lake (Figure Rd2)

Bates Lake is a small, shallow lake with much of its surface area covered in emergent vegetation - mainly scirpus and pond lily with extensive zones of phragmites. The immediate backshore is fringed in carex, grass and willow. Mallard, lesser scaup, coot, wigeon and white scoter are the main waterfowl species present with an index of 9.04 indicating moderate production.

Water level in the lake could be raised .5 m without adversely affecting wildlife.


scirpus
lily
phragmites
N
1:50,000

Bates Lake
Figure Rd2

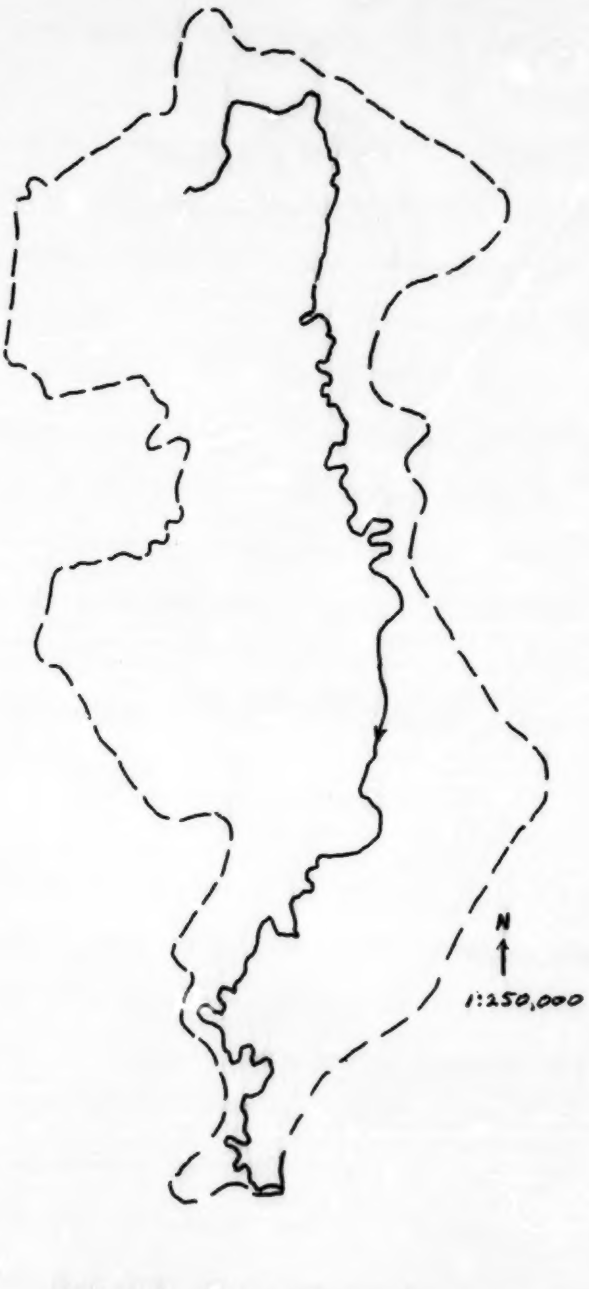
MEDLEY RIVER SUBWATERSHED (Figure Md1)

The Medley River drains a relatively flat area containing extensive black spruce muskegs with very diverse mixwoods on the upland and along water channels. The subwatershed contains no lakes hence water related wildlife is associated with the Medley River and its few small tributaries. The low gradient meandering nature of the river combined with the associated riparian deciduous growth provides excellent beaver habitat. Searing (1979) located 1.2 beaver lodges per km of shoreline in the lower Medley River which is a much higher density than reported elsewhere in boreal regions (Table II) and even higher than that in the general area northwest of Cold Lake where the average is 0.9 ledges/km.

Trapping returns for beaver, mink, muskrat and otter in the lower Medley River area have been variable with a high of near $5000 realized in 1979-80 from 96 beaver, 102 muskrat and 43 mink.

The upper portion of the Medley River is located within the DND Air Weapons Range and surveys were not completed. However aerial photo investigations indicate beaver density is comparable to that in the lower area. Otter are also present in the upper streams.

Factors leading to high beaver density include (a) the relatively large total area available due to the meandering nature of the streams; (b) a suitable, readily available riparian vegetation as a food source and as construction material for lodges and dams; and (c) the suitability of the water regime, i.e. muskegs damper high spring flows protecting dams and lodges



Medley River Subwatershed
Figure Md1

and release water slowly but steadily during dry periods and in winter. Winter flows are especially important to maintain under-ice access to lodges and food caches.

Any attempt to manipulate water flows in the Medley River especially resulting in changes during winter will affect beaver survival.

LOWER BEAVER RIVER SUBWATERSHED (Figure B1)

The Lower Beaver River subwatershed is the area which includes the well defined Beaver River valley, its flood plain and extentions above the valley breaks at various intervals. The top land is relatively flat and influenced extensively by agricultural cropland. Undeveloped areas including much of the valley breaks is treed in aspen dominated mixed wood.

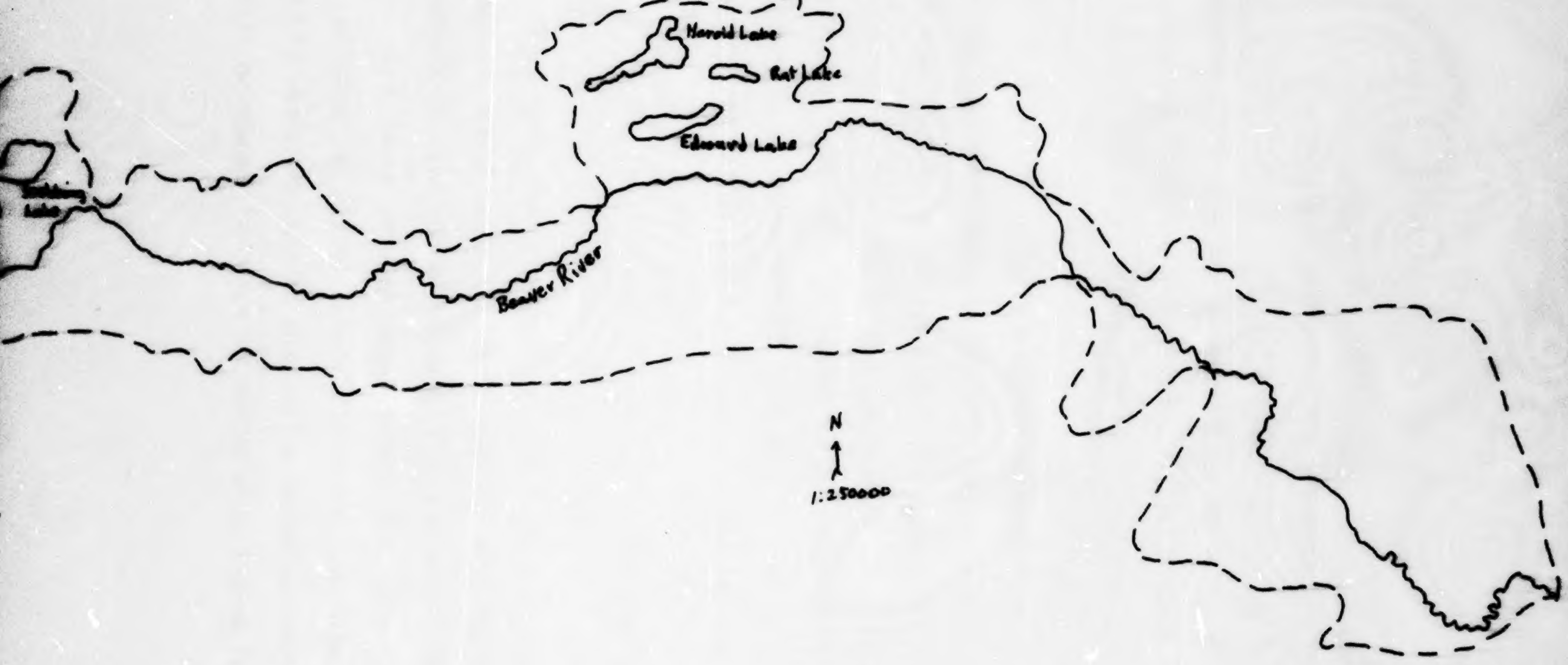
The Beaver River, although contained within a significant valley, meanders intricately on its flood plain. No quantitative wildlife surveys have been conducted but the river is known to support various wildlife species including beaver, blue heron, merganser, bufflehead and goldeneye.

Flow rates are generally too fast and fluctuating to allow extensive build up of beaver dams and lodges and beaver use bank burrows for overwintering.

Edward Lake (Figure B2)

Edward Lake is a small shallow lake surrounded mainly by aspen dominated mixed-wood forest with an open carex and grass fringe on the shoreline. Emergents are diverse and well developed giving rise to abundant waterfowl (Index 17.31) with main species being mallard, eared grebe (large colony (2000+) - location not determined), wigeon, gadwall and shoveller. Of special note are numerous canvasback and probable colonies of common and black tern.

Lake level appears to be optimum for waterfowl and muskrat production.


Harold Lake
Rat Lake
Edward Lake
Lake
Beaver River
N
1:250000

Lower Beaver River Subwatershed
Figure B1

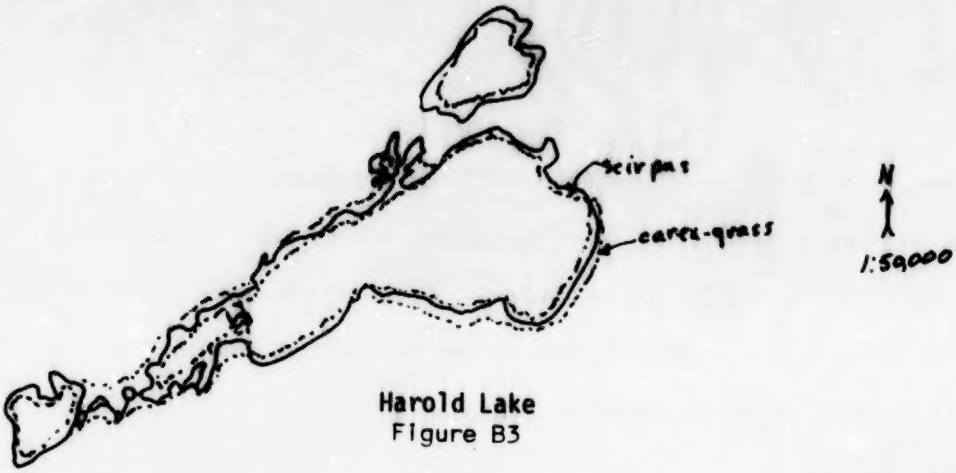
Harold Lake (Figure B3)

Harold Lake is a small, shallow lake with an irregular shoreline and a lush, diverse and well developed emergent zone. Waterfowl production is exceptional (Index 19.39) with lesser scaup, eared grebe (no location of colony) gadwall, goldeneye and white-winged scoter being most common.

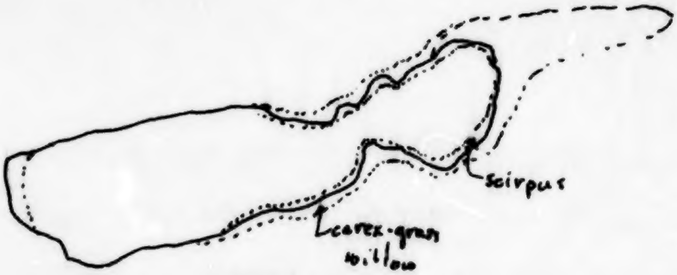
Water level appears to be optimum for waterfowl production.

Stebbing Lake (Figure B4)

Stebbing Lake is a small, shallow (3m) lake with a very lush and diverse emergent zone along most of the shoreline and around the two islands. Waterfowl productivity on the lake is exceptional (Index 16.34) with mallard, gadwall, lesser scaup, eared grebe (large colony - location not determined) and wigeon being most common. Of note are Canada geese (2-6 pairs). The lake is an important fall staging area for a variety of waterfowl and is currently protected from sporthunting.


scirpus
carex-grass
N
1:59,000

Harold Lake
Figure B3


scirpus
carex-grass
willow

Edward Lake
Figure B2

Literature Cited

Boyd, M. 1977. Analysis of fur production records by individual fur bearing species for registered trapping areas in Alberta, 1970-75. Alberta Fish and Wildlife unpub.

Brown, P. 1974. (Title not available)-study was done on scoter nesting on Jessie Lake - University of Iowa.

Gunderson, G. 1981. WMU 500 Ungulate Survey. December 18/81. Alberta Fish and Wildlife unpub.

McGregor, C. 1982. Assessment of the effect of water level flucuations on land - water interface (on BRWRS lakes) - Alberta Environment-unpub.

Searing, G. 1979. The status of beaver and muskrat populations in the Cold Lake Area, Alberta. LGL unpub.